USER MANUAL FOR THE ELECTRONIC SYSTEM

SST 2015

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NOTE Provides key information to make the procedure easier to understand and carry out.

CAUTION Refers to specific procedures to carry out for preventing damages to the vehicle.

WARNING Refers to specific procedures to carry out to prevent injuries to the repairer.

Personal safety Failure to completely observe these instructions will result in serious risk of personal injury.

Safeguarding the environment Sections marked with this symbol indicate the correct use of the vehicle to prevent damaging the environment.

Vehicle intactness The incomplete or non-observance of these regulations leads to the risk of serious damage to the vehicle and sometimes even the invalidity of the guarantee

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KIT PRESENTATION	PRE

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KIT DESCRIPTION

1. ELECTRONIC CONTROL UNIT

2. INSTRUMENT PANEL

3. PDA

4. OPTIONAL

5. STRATEGIES

6. SOFTWARE PRESENTATION

Based on the experience of racer motorcycles during the last 20 years, Aprilia Racing has developed an electronic racing kit dedicated for the track use for the vehicle "RSV4SST". Purpose of this document is to describe the electronic kit, its potentiality and the installation on the motorcycle.

Kit Description

The electronic kit consists of:

Control unit

It is the electronic control unit developed and made by Aprilia Racing The electronic control unit APX2 is the electronic control unit for the management of the engine and the acquisition of the data.
For the management of the motorcycle parameters and the data analysis the ARES and ABM BASE software are supplied

Instrument panel

It is the Matrix\RSS instrument panel developed by Aprilia Racing. With this it is possible to display a lot of information among which rpm (analogue or digital display), important engine parameters and parameters for the driver.

PDA

The PDA is the interface between the user and the electronic system of the motorcycle. This interface is included in the motorcycle options, but it is necessary to perform several engine parameter adjustments (necessary for the correct operation of the engine) and to display the acquisition base parameters.
The PDA is supplied together with a connection cable to the motorcycle.

Optional

This is a list of the possible options of the electronic kit:

- RACING PUSH-BUTTON PANEL Used in replacement of the standard push-button panel of the left semi-handlebar.
- GPS Used for the beacon and for the visualisation of the track path.
- LOAD CELL Used for the activation of the Kicker\Blipper strategy.
- SUSPENSION POTENTIOMETER Used for the acquisition of the fork and shock absorber extension.
- FRONT BRAKE PRESSURE SENSOR Used for the acquisition of the front brake system pressure
- LAMBDA KIT Used for the acquisition of the stoichiometric ratio of each cylinder. It is further possible to activate the automatic correction of injection times (automatic lambda strategy).
- REAR LIGHT Used to increase the visibility of the vehicle in situations of limited visibility (WET). The device is mandatory for the participation to some races and/or championships.

Strategies

This is the list of the strategies and parameters integrated in the system:

- RPM LIMITER MAX rpm limiter can be configured for each gear.
- PIT-LANE SPEED LIMITER Pit-lane speed limiter, programmable.
- ETC Electronic throttle grip control.
- VTP Variable intake duct position.
- TCS Traction control system.
- ADAPTIVE TCS Adaptive traction control.
- DISTANCE BASED Strategies and/or parameters configuration system based on the distance.
- ENGINE BRAKING Programmable engine braking for each gear.
- POWER REDUCTION Power reduction system for each gear.
- WHEELIE CTRL Anti wheeling system, can be configured.
- LAUNCH CTRL Assisted launch control.
- BACKLASH CTRL Anti-jerk clearance recovery system.
- QUICK GEARSHIFT Power-assisted gear shifting system.
- KICKER STRATEGY (BLIPPER STRATEGY)-(OPTIONAL) Assisted downshift system.
- LAP TIME-(OPTIONAL) Lap time detection system.

Software presentation

This is the list of the software offered and usable by our system:

- ADVIEWER Is the software developed by Aprilia Racing used to download, display and analyse the acquired data. This software allows downloading the data and then analyse the same with additional tools such as complex mathematical functions, different types of graph,

distance-time, XY, XYZ, histograms, histogram maps, simple graphs with circuit or parametric, static, alarm management , conditions management, exporting to other formats, and much more ....

- WIN CHANNEL EDITOR Is the software developed by Aprilia Racing used for the management of the acquisition table of APX2. This software allows to modify the Alias of the control unit, cancel all acquisition data, connect in real time to the acquisition system, receive, transmit, modify the acquisition table of the motorcycle.
- ARES Is the software developed by Aprilia Racing used for the complete management of the parameters and strategies of the motorcycle. It is possible to apply the modifications to the injection maps (interfacing with Mapcorrector),add\remove curves (Dry\Wet) and modify all parameters, perform all preliminary settings of the motorcycle (possible also with the PDA) and much more…
- MAPCORRECTOR Is the software developed by Aprilia Racing used for the correction of the fuel injection of the motorcycle. The software receives the data of the lambda probe reading from the data acquisition file, the injection times used and though a calculation algorithm, which takes account of a preselected target, creates a fuel injection map.
- ANALYSIS Is the software developed by Aprilia Racing used for the implementation of the motorcycle. This software allows to have a general view of the implementation of the motorcycle both numeric and graphic. It is possible to export all data in a file excel to have a detailed report of the performed modifications, of each test of one day or an entire event. Calculate and simulate future configurations (after a front and rear modification, refill the calculated parameters). It is therefore possible to analyse the calculated configuration before applying the modifications to the motorcycle.

INDEX OF TOPICS

MOTORCYCLE ASSEMBLY	MON

Index:

PRELIMINARY OPERATIONS

1. THINGS TO REMOVE FROM THE MOTORCYCLE

2. THINGS TO REPLACE ON THE MOTORCYCLE

3. INSTRUMENT PANEL SUPPORT MODIFICATION

4. CONTROL UNIT SUPPORT ASSEMBLY

5. INSTRUMENT PANEL ASSEMBLY ON CONTROL UNIT SUPPORT

6. VEHICLE WIRING HARNESS ASSEMBLY - RSV4 FACTORY A-PRC 2015

7. ENGINE WIRING HARNESS ASSEMBLY - RSV4 FACTORY A-PRC 2015

WIRING HARNESSES

8. VEHICLE MULTI-WIRE CABLE HARNESS

9. VEHICLE SINGLE WIRE CABLE HARNESS

10. ENGINE MULTI-WIRE CABLE HARNESS

11. ENGINE SINGLE WIRE CABLE HARNESS

12. MATRIX/RSS DASHBOARD (E09042) INSTRUMENT PANEL DEMAND WIRING HARNESS

13. DISPLAY

14. PUSH-BUTTON PANEL LED SIGNALLING

15. STANDARD PUSH-BUTTON PANEL MODIFICATION

16. LEFT PUSH-BUTTON PANEL DESCRIPTION

17. RIGHT PUSH-BUTTON PANEL DESCRIPTION

Preliminary operations

Things to take off the motorcycle

The first operation to be made is to remove from the standard motorcycle the unused parts:

- Vehicle cable harness
- Engine cable harness
- Front light
- Rear light
- Front turn indicators
- Rear turn indicators
- Ignition switch assembly
- Left push-button panel (requests a modification)
- TCS push-button panel
- Instrument panel
- Engine control unit
- Stand

- MAP sensors (pressure under throttle valve)

Things to be replaced on the motorcycle

- Gear potentiometer from linear selector
- The connection pipes of the MAP sensors with the holes closure caps of the pipes under throttle valve

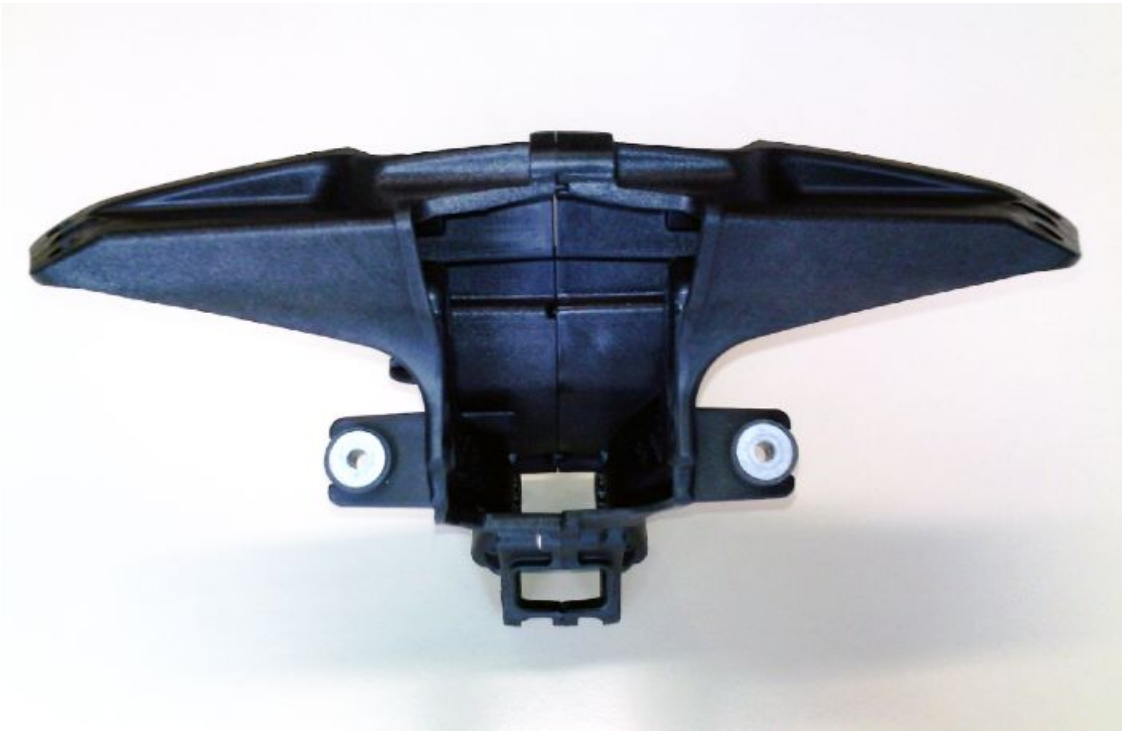
Change instrument panel support

The instrument panel support to be able to house the inertial platform and to mount the engine control unit holder support must be modified.

- The marked hole must be widened up to 5mm in diameter.

- Remove the part marked in red.

- The modified support will be the one in the image



Control unit support assembly

Mount the accessories on the bar as shown, paying attention that all elastic plates (1) are M6 except the two indicated (2) that have the hole M5.

Instrument panel assembly on control panel support

In the figures shown below, the completely mounted instrument panel control unit is visible

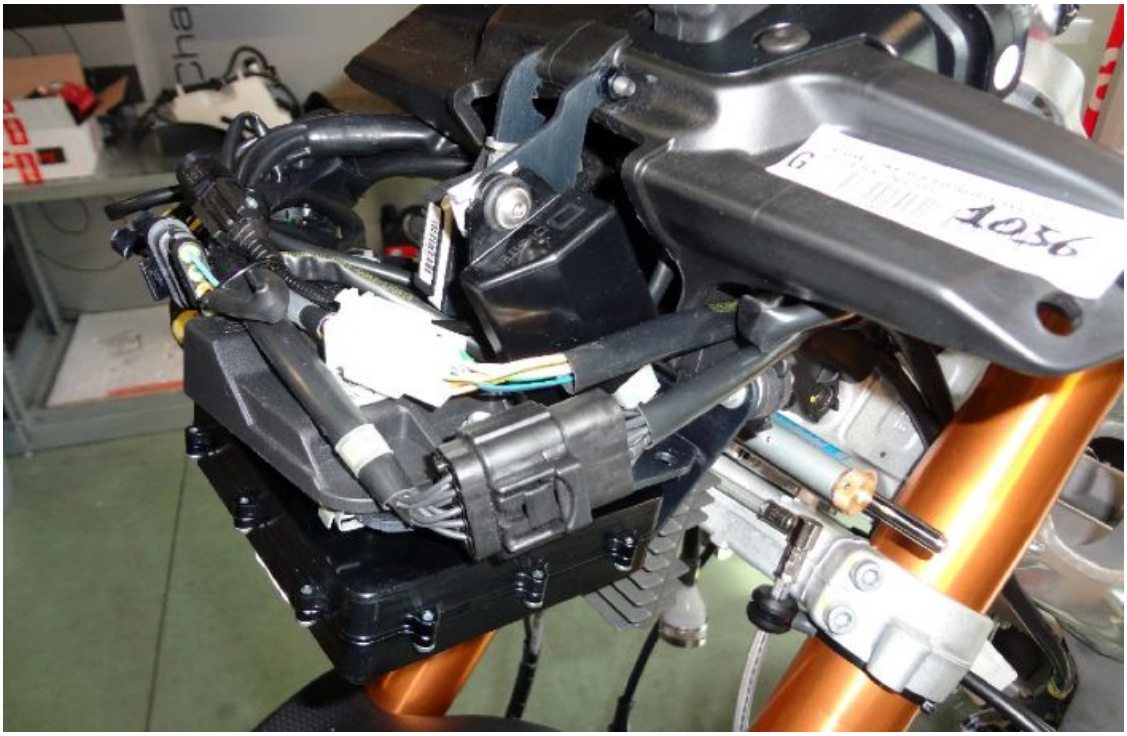
VEHICLE CABLE HARNESS MOUNTING - RSV4 FACTORY APRC 2015

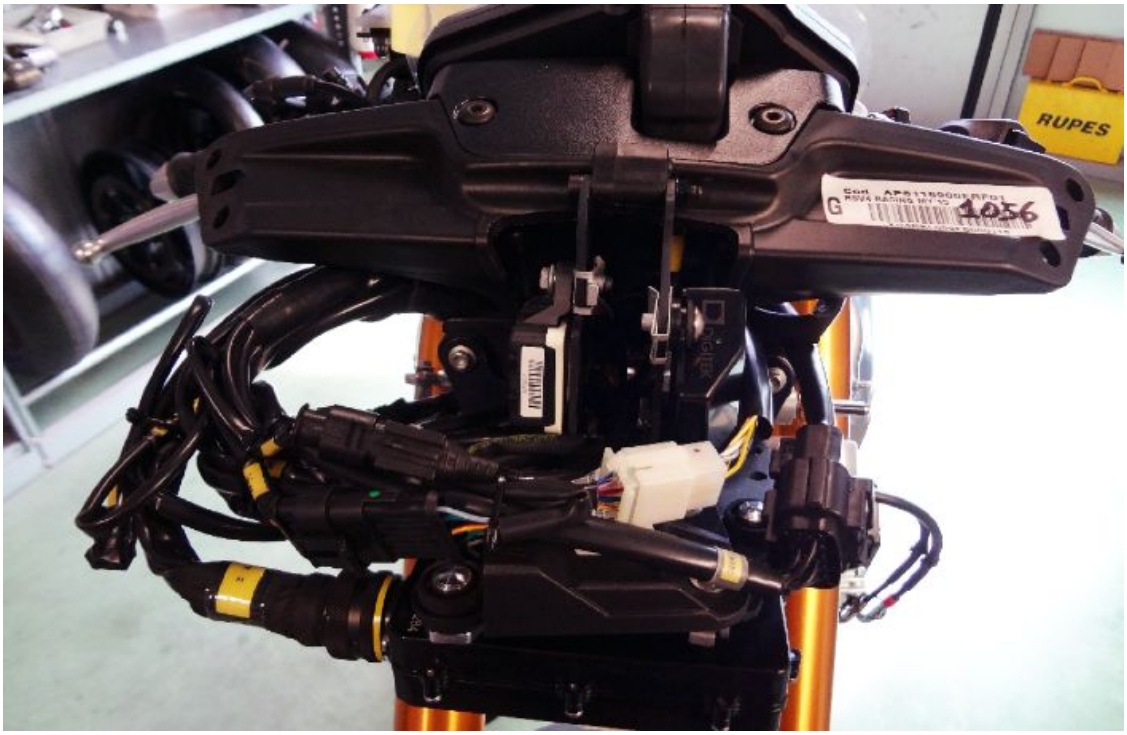
The following photos are used to give indications on how to mount the vehicle wiring harness correctly on the motorcycle following the specifications for which it was designed.

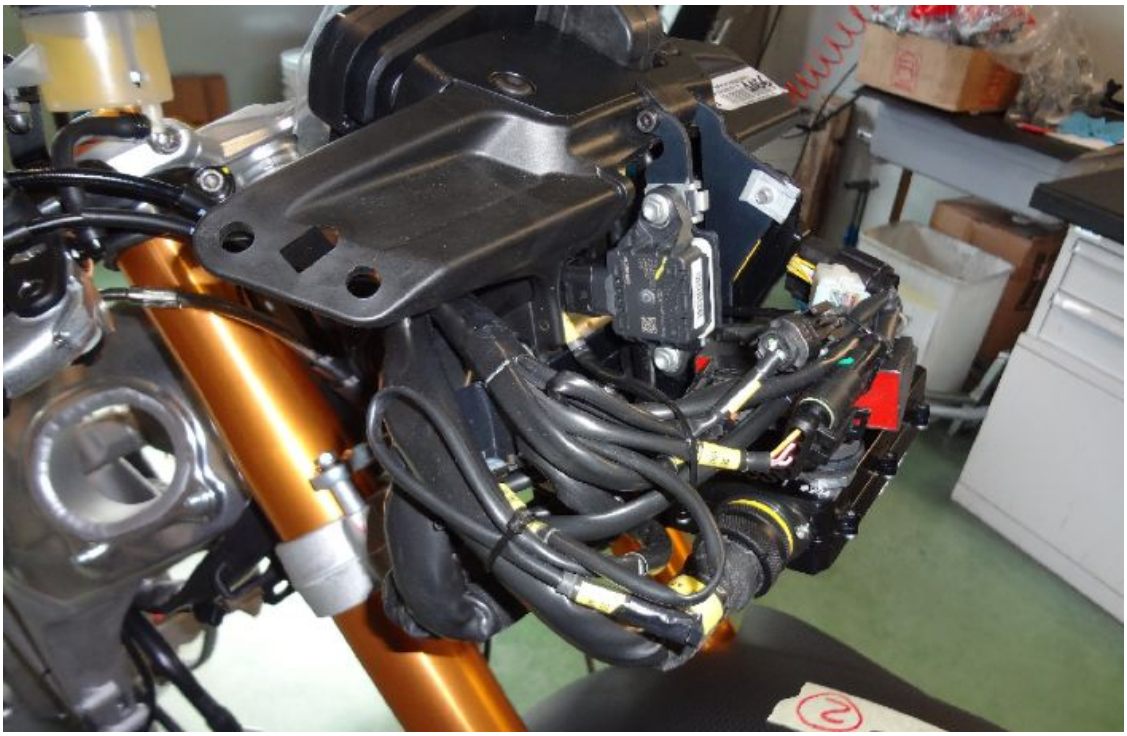
Below a list of information to keep in mind:

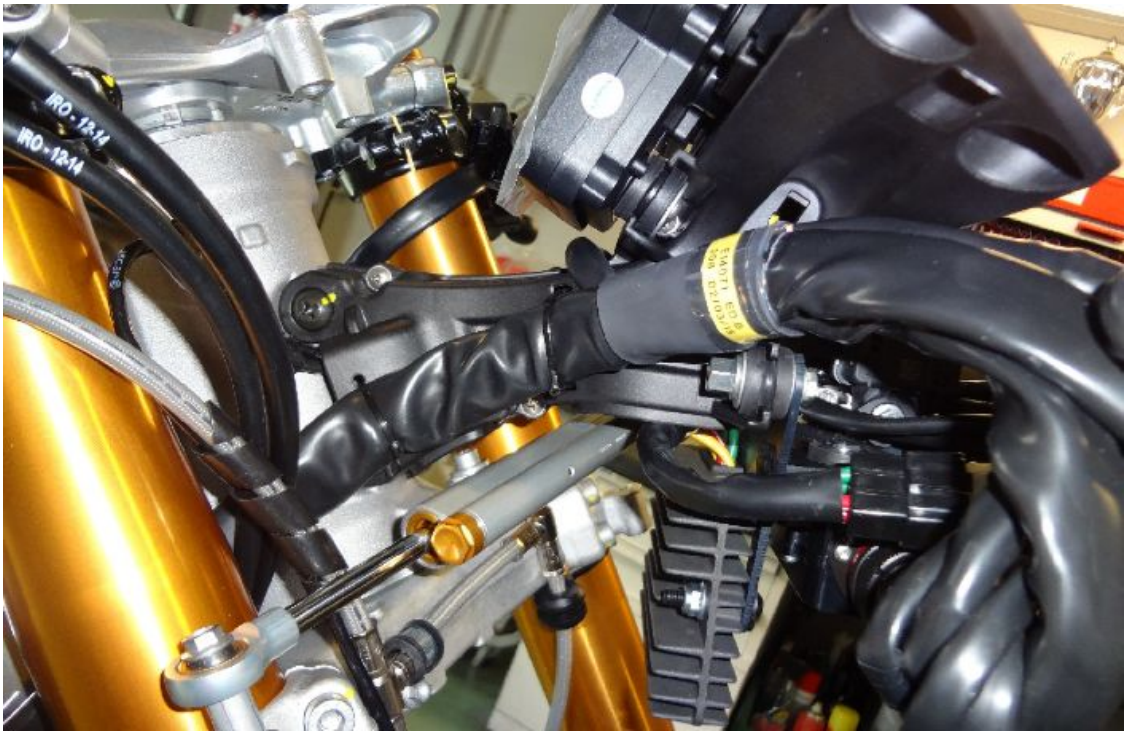
NOTE

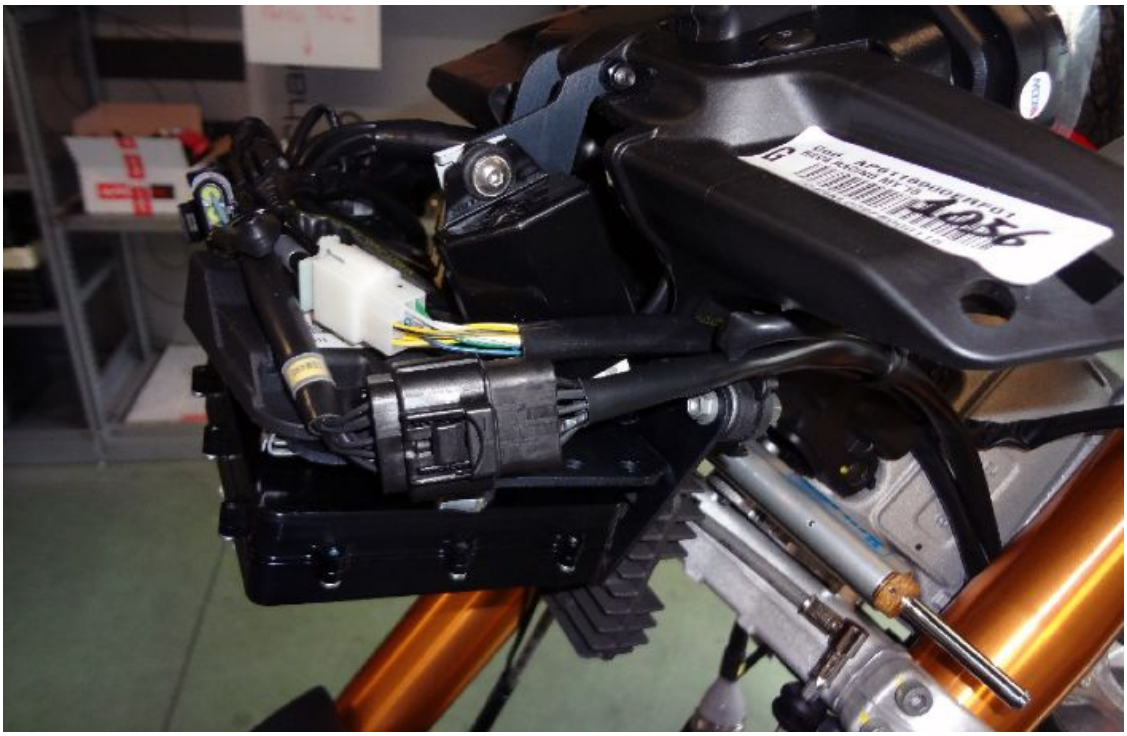
BEFORE MOUNTING THE WIRING HARNESS, FIT THE COMPLETE INSTRUMENT PANEL SUPPORT TO THE MOTORCYCLE ENGINE.
PAY ATTENTION THAT ALL BRANCHES OF THE WIRING HARNESS, ONCE POSITIONED, ARE NEVER TOO TIGHTENED.
THE WIRING HARNESS SHALL NOT PASS NEAR MATERIAL OR EDGES, WHICH THROUGH THE VIBRATIONS OF THE VEHICLE, COULD COMPROMISE THE INTEGRITY. IN CASE THIS IS NOT POSSIBLE, PROTECT THE ZONE OR THE WIRING HARNESS IN ORDER TO AVOID BREAKAGE.
THE GROUND EYELETS MUST BE CONNECTED TO METAL PARTS, ELIMINATE ANY PAINTING OR ANODIZING THAT COULD COMPROMISE THE CONDUCTIVITY

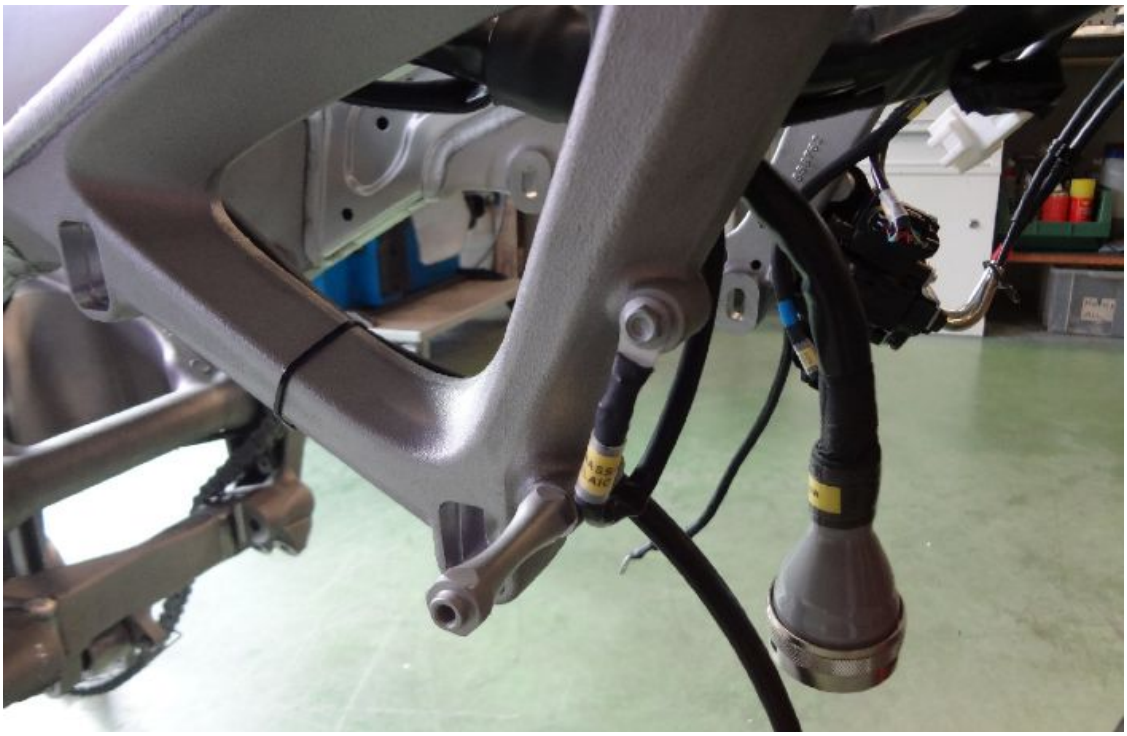


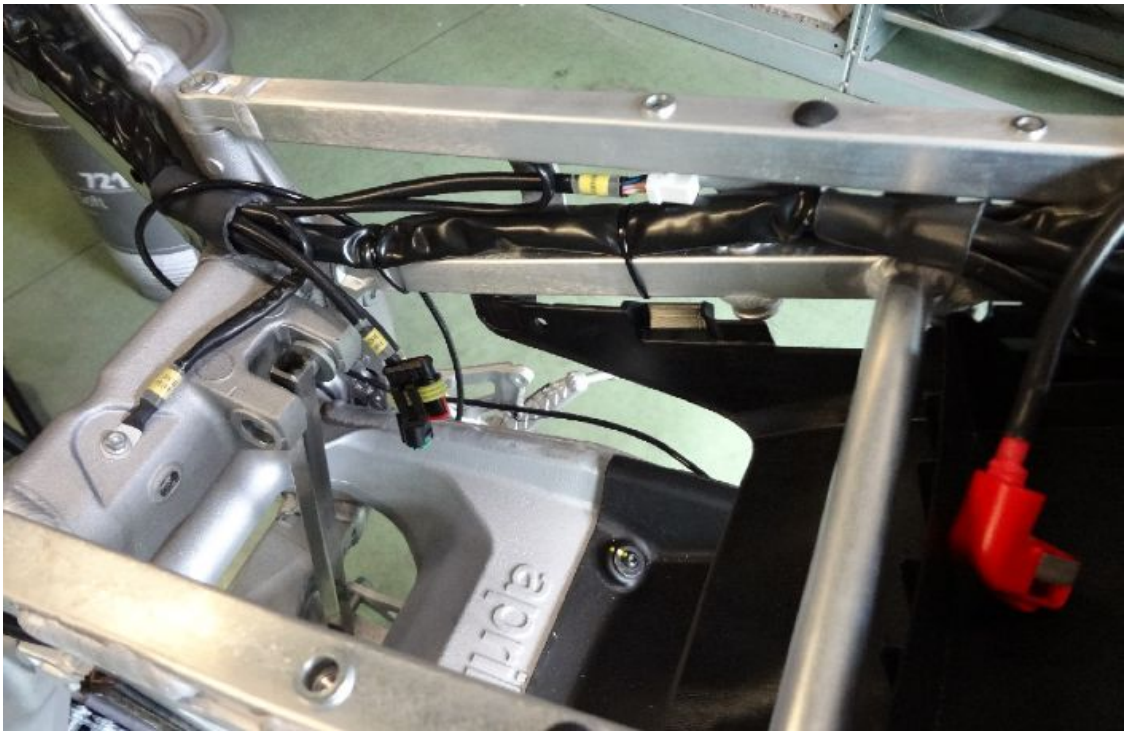

RUPES
1056

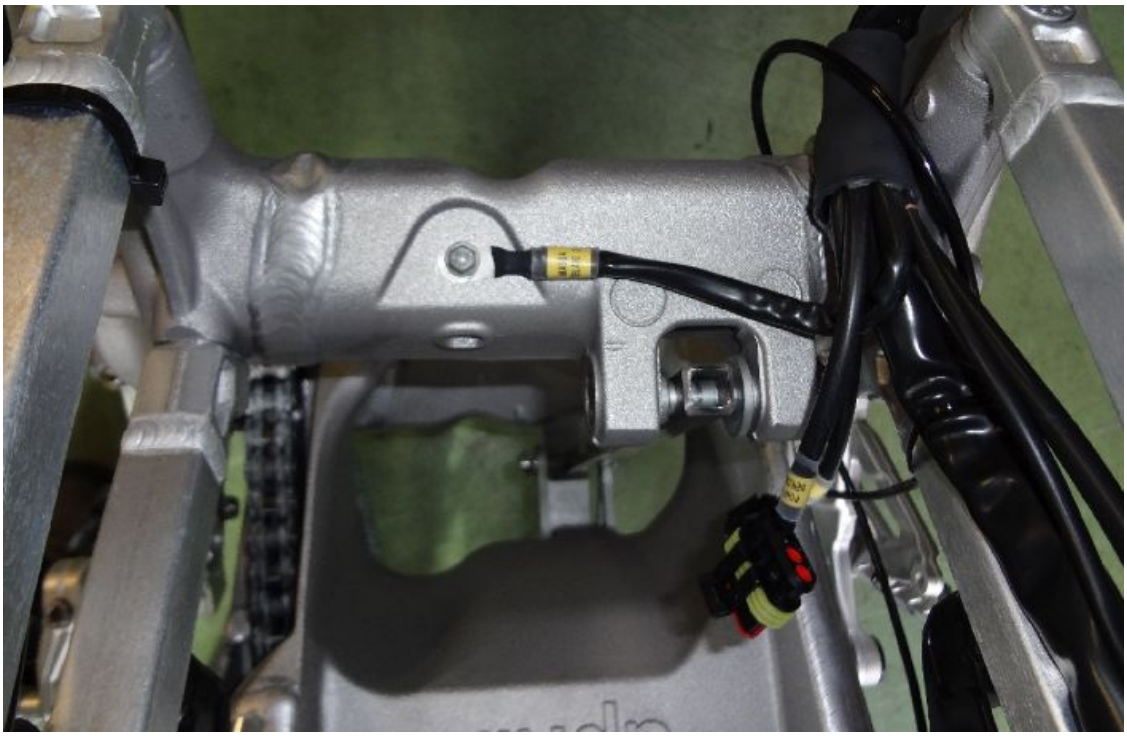


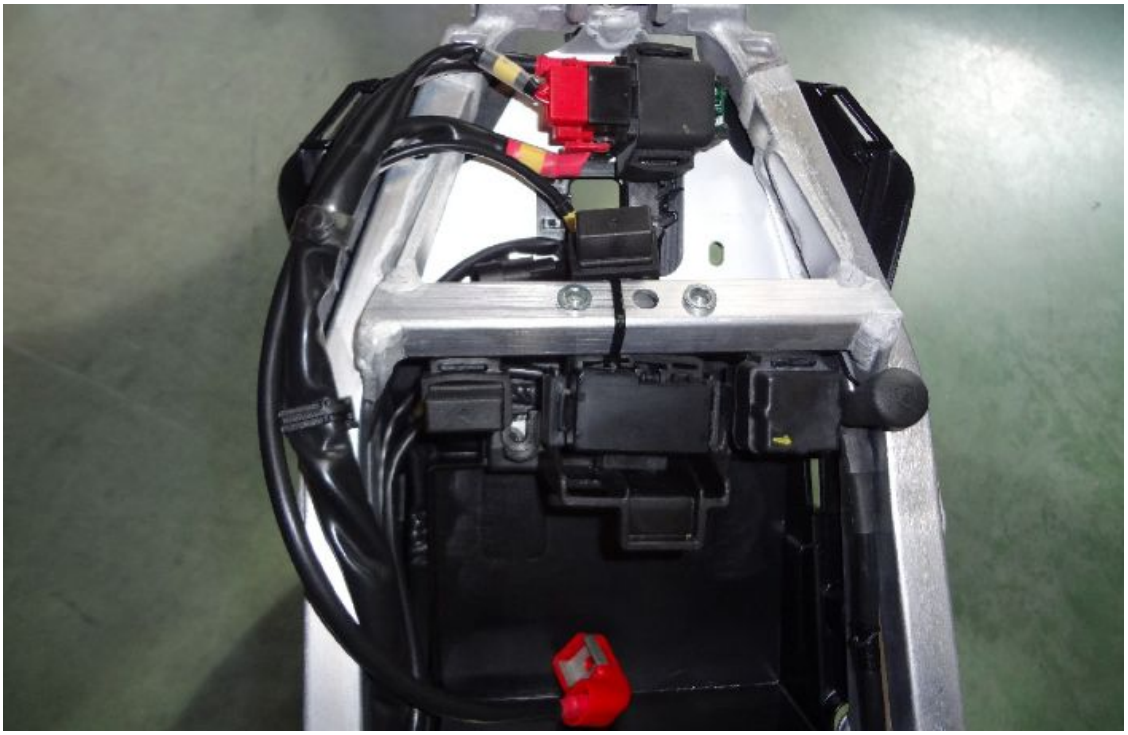

IRO - 12-14
IRO - 12-14







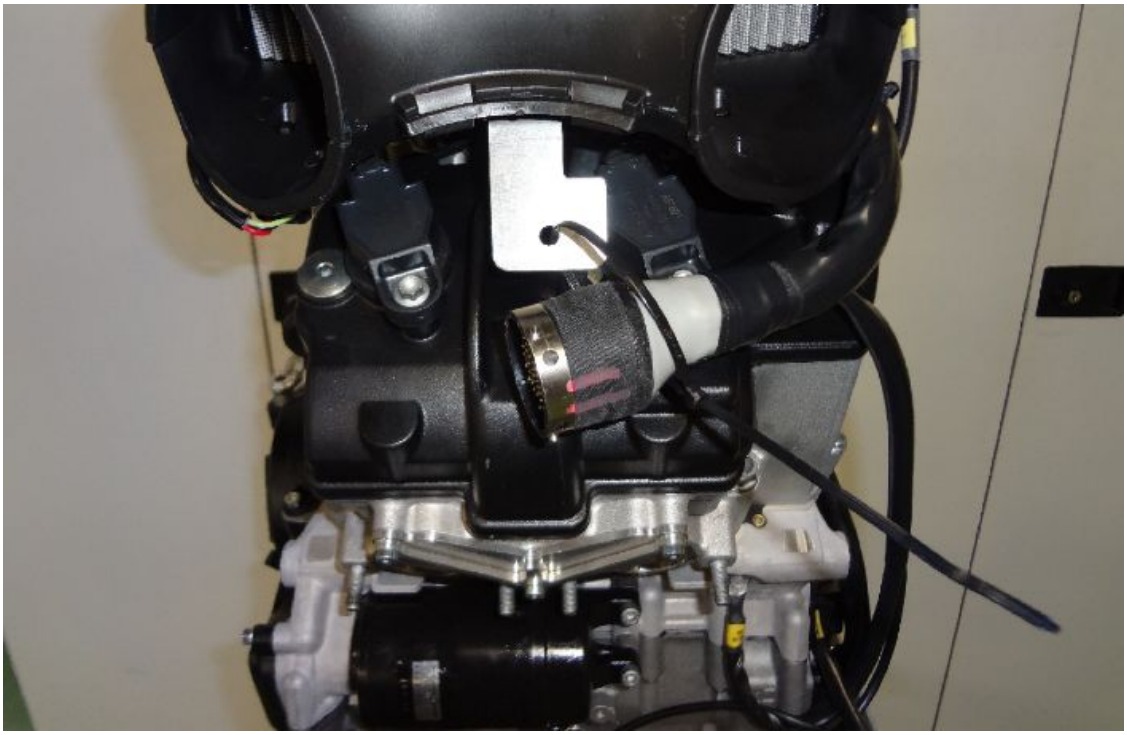


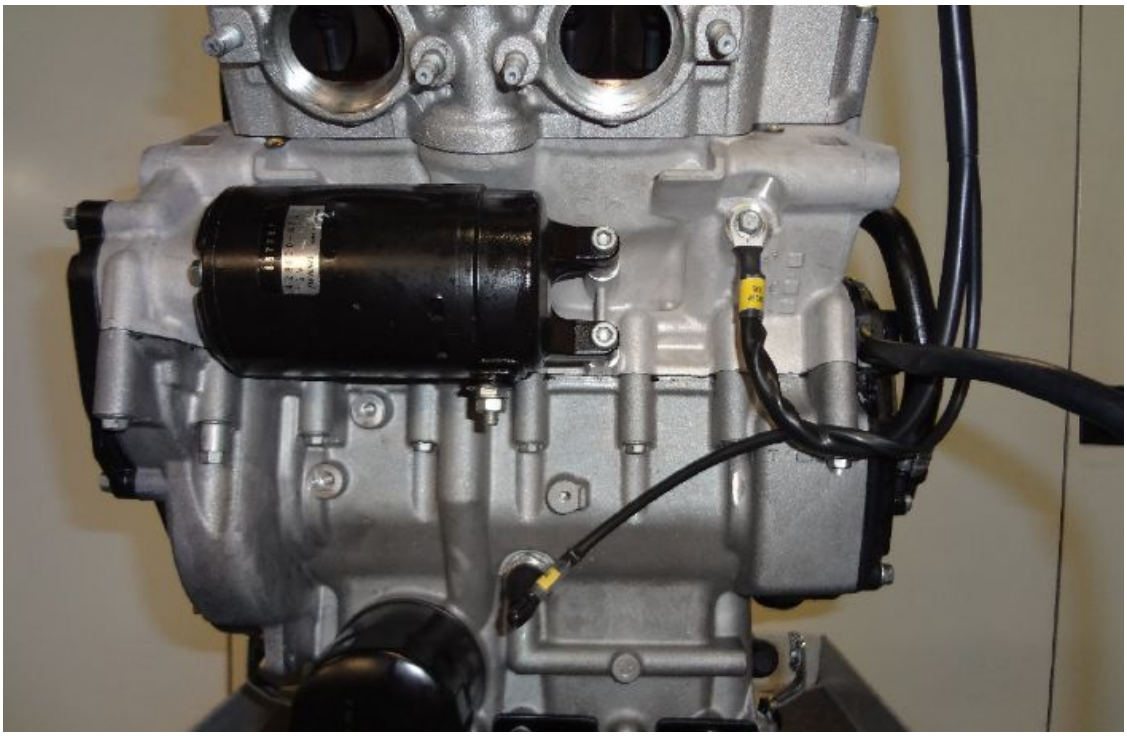


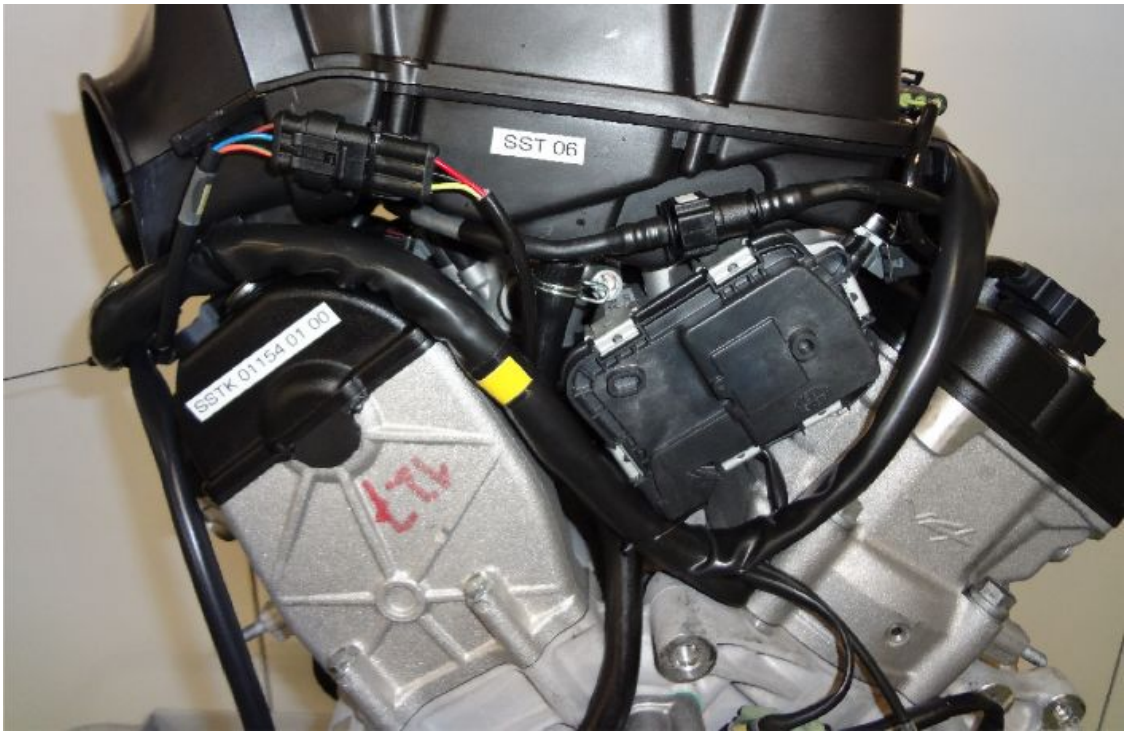
TCS
−
+

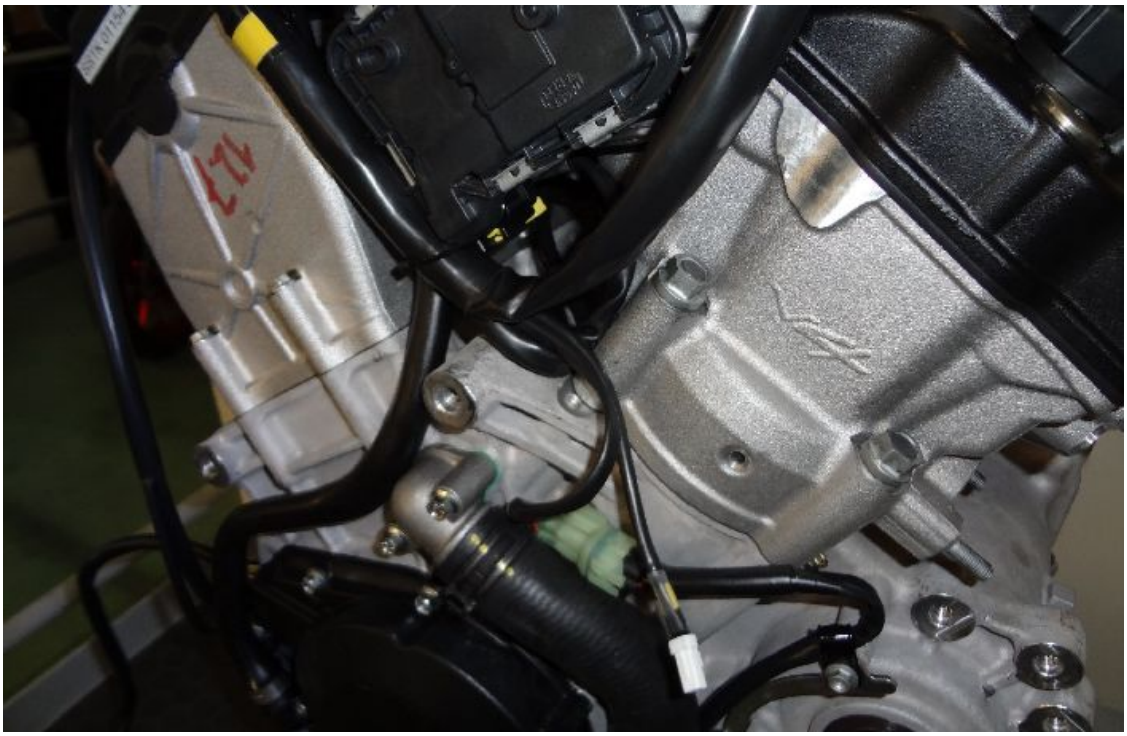
VEHICLE CABLE HARNESS MOUNTING - RSV4 FACTORY APRC 2015

The following photos are used to give indications of what may be an optimal mounting of the engine wiring harness on the motorcycle RF 2015.
The indications for the mounting are the same as listed for the mounting of the vehicle wiring harness.
As you can see in the photo, it is recommended to mount the wiring harness on the engine before installing it on the motorcycle.






SST 06
SSTK 01154 01 00



WARNING
NON AVVIARE MOTORE
CON CASSAFILTRO APERTA
SST 06
DO NOT START ENGINE
WITH AIRBOX OPEN

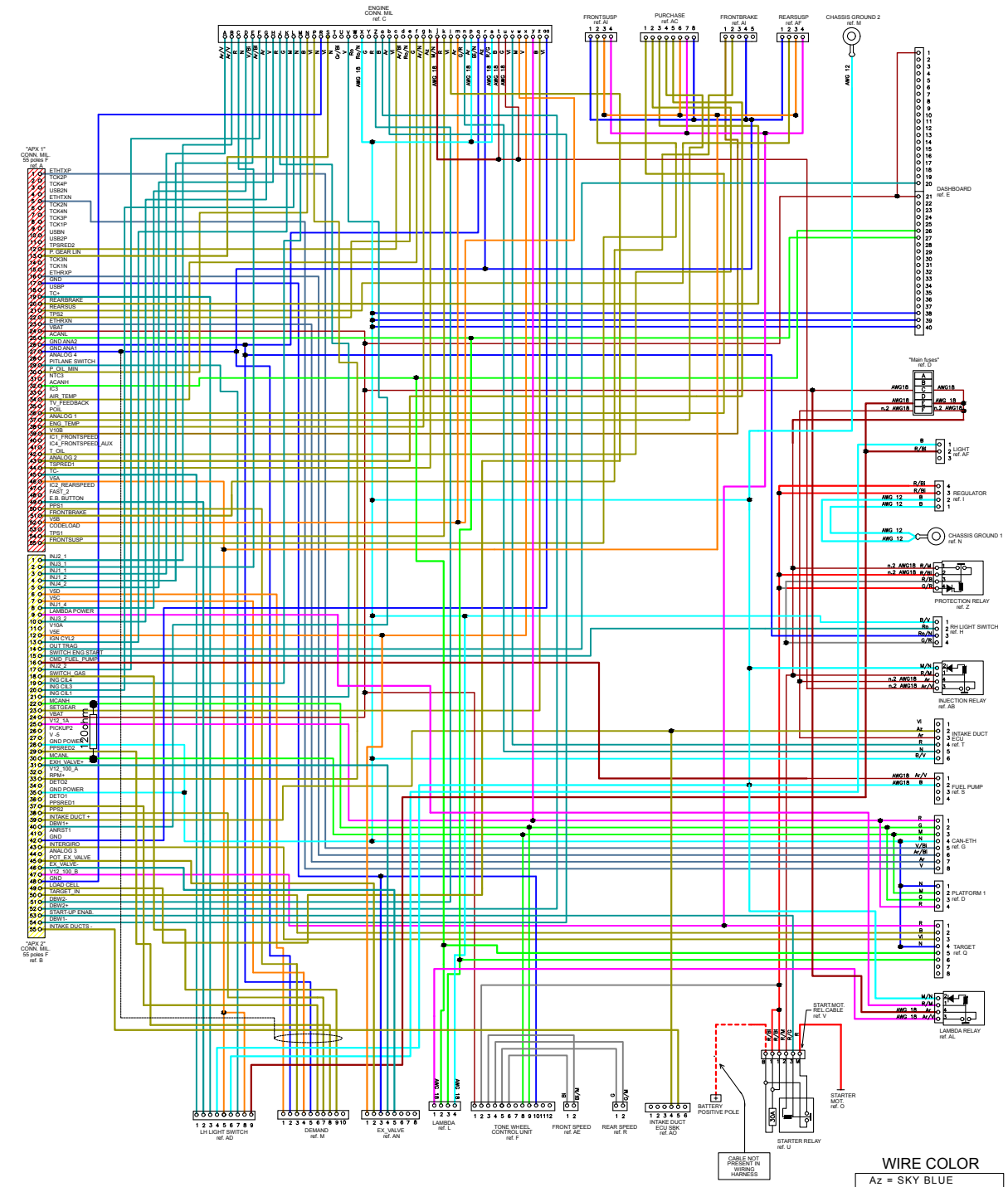
WARNING

SST 06
SSTK 01154 01 00

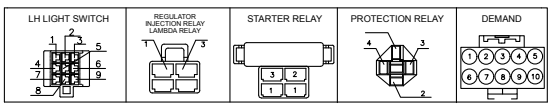
SST 06
SSTK 01154 01 00

CABLE HARNESSES

VEHICLE MULTIFILAMENT CABLE HARNESS


ENGINE CONN. MIL ref. C
FRONTSUSP ref. AI
PURCHASE ref. AC
FRONTBRAKE ref. AI
REARSUSP ref. AF
CHASSIS GROUND 2 ref. M
"APX 1" CONN. MIL 55 poles F ref. A
"APX 2" CONN. MIL 55 poles F ref. B
DASHBOARD ref. E
"Main fuses" ref. D
LIGHT ref. AF
REGULATOR ref. I
CHASSIS GROUND 1 ref. N
PROTECTION RELAY ref. Z
RH LIGHT SWITCH ref. H
INJECTION RELAY ref. AB
INTAKE DUCT ECU ref. T
FUEL PUMP ref. S
CAN-ETH ref. G
PLATFORM 1 ref. D
TARGET ref. Q
LAMBDA RELAY ref. AL
START MOT. REL.CABLE ref. V
STARTER MOT. ref. O
STARTER RELAY ref. U
BATTERY POSITIVE POLE
CABLE NOT PRESENT IN WIRING HARNESS
LH LIGHT SWITCH ref. AD
DEMAND ref. M
EX. VALVE ref. AN
LAMBDA ref. L
TONE WHEEL CONTROL UNIT ref. F
FRONT SPEED ref. AE
REAR SPEED ref. R
INTAKE DUCT ECU SW. ref. AO

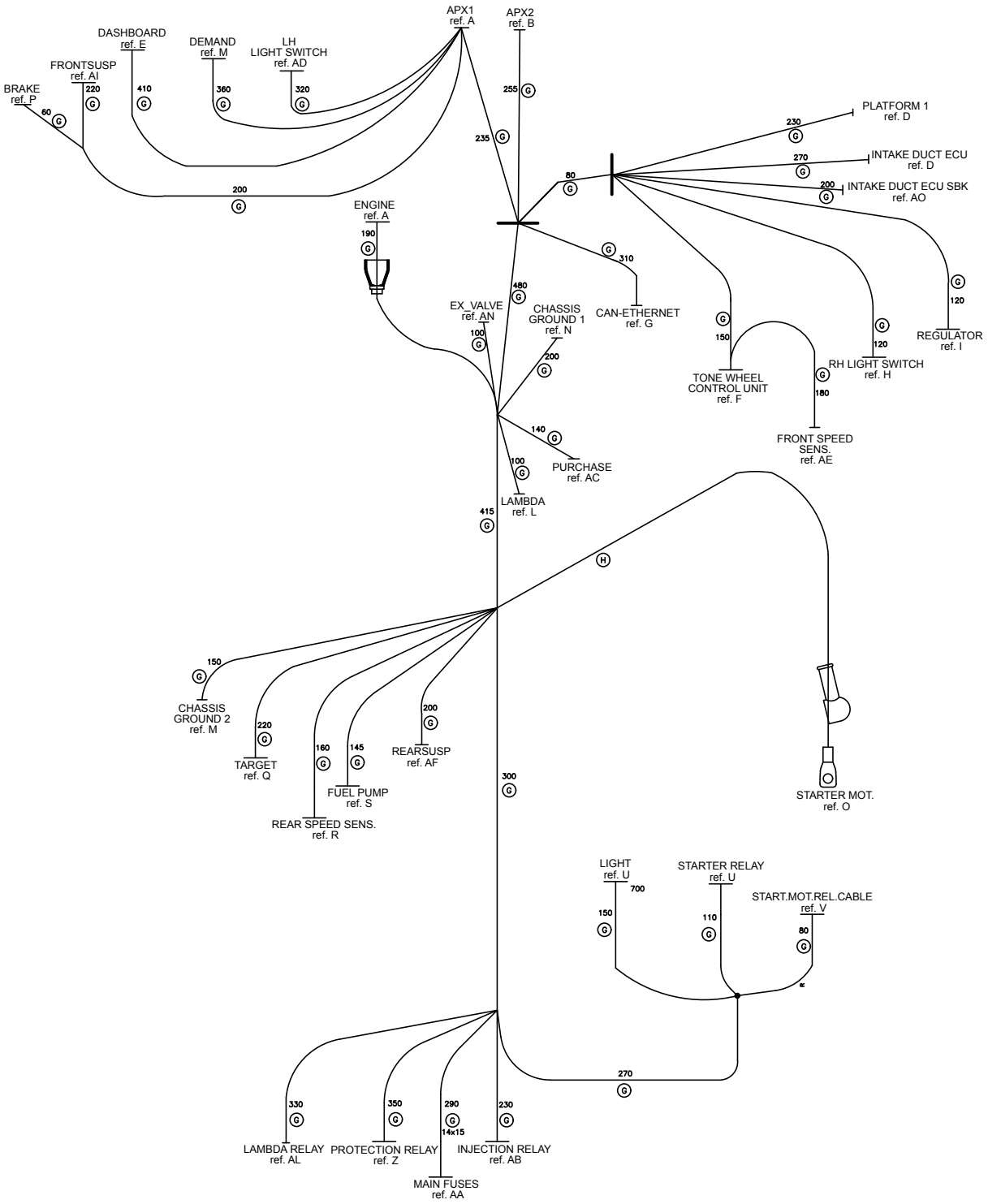
PIN-OUT CONNETTORS - CABLES SIDE VIEW



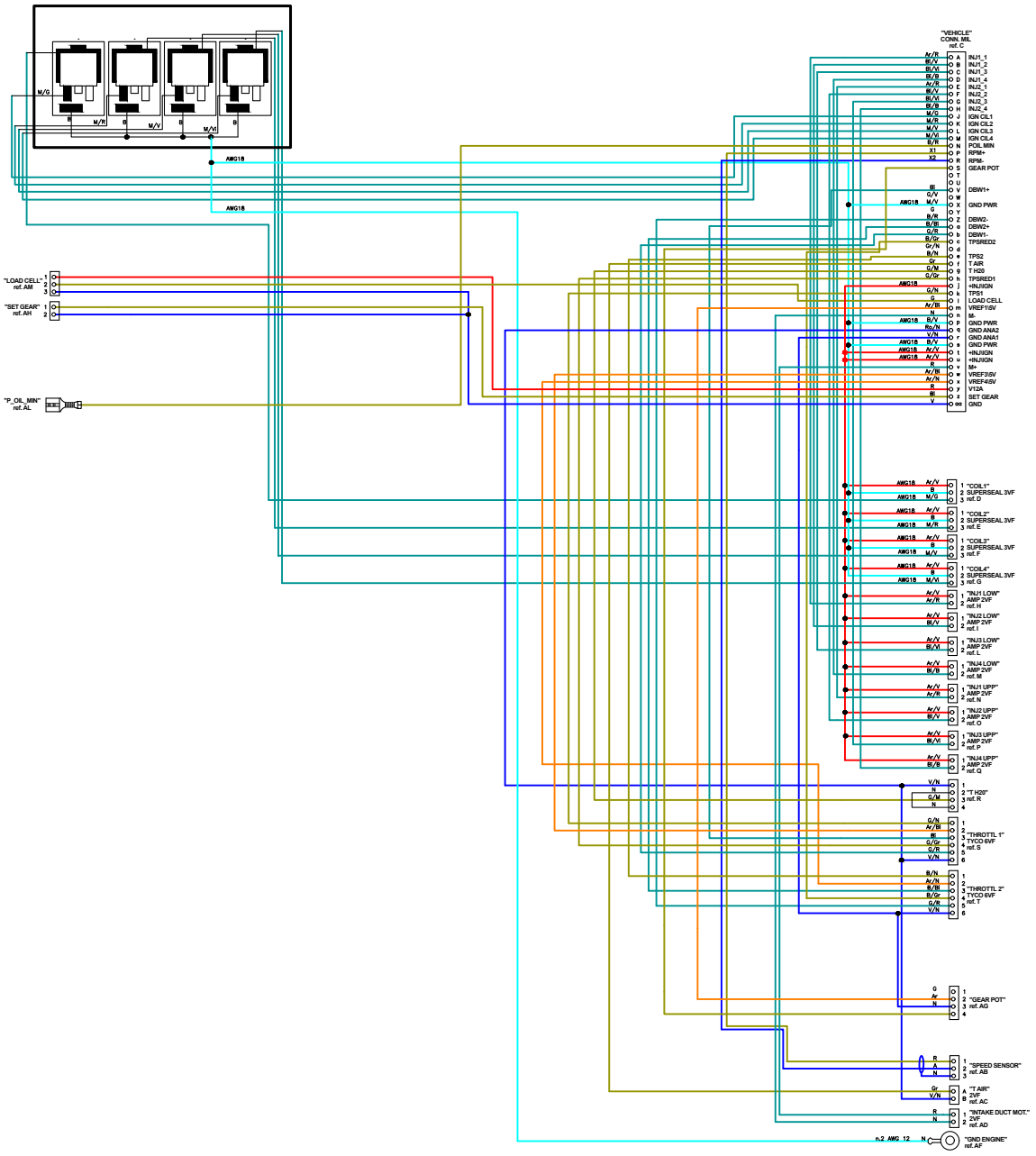
FUSES	
C	15A
F	15A
E	3A

WIRE COLOR
Az = SKY BLUE
Bi = WHITE
Ar = ORANGE
G = YELLOW
Gr = GREY
B = BLUE
M = BROWN
N = BLACK
R = RED
Ro = PINK
V = GREEN
Vi = PURPLE

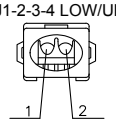
VEHICLE SINGLE FILAMENT CABLE HARNESS



ENGINE MULTIFILAMENT CABLE HARNESS


"VEHICLE" CONN. MIL ref. C
"LOAD CELL" ref. AM
"SET GEAR" ref. AH
"P_OIL_MIN" ref. AL
AWG18
"COIL1" SUPERSEAL 3VF ref. D
"COIL2" SUPERSEAL 3VF ref. E
"COIL3" SUPERSEAL 3VF ref. F
"COIL4" SUPERSEAL 3VF ref. G
"INJ1 LOW" AMP 2VF ref. H
"INJ2 LOW" AMP 2VF ref. I
"INJ3 LOW" AMP 2VF ref. L
"INJ4 LOW" AMP 2VF ref. M
"INJ1 UPP" AMP 2VF ref. N
"INJ2 UPP" AMP 2VF ref. O
"INJ3 UPP" AMP 2VF ref. P
"INJ4 UPP" AMP 2VF ref. Q
"T H20" ref. R
"THROTTL 1" TYCO 6VF ref. S
"THROTTL 2" TYCO 6VF ref. T
"GEAR POT" ref. AG
"SPEED SENSOR" ref. AB
"T AIR" 2VF ref. AC
"INTAKE DUCT MOT." 2VF ref. AD
n.2 AWG 12
"GND ENGINE" ref. AF

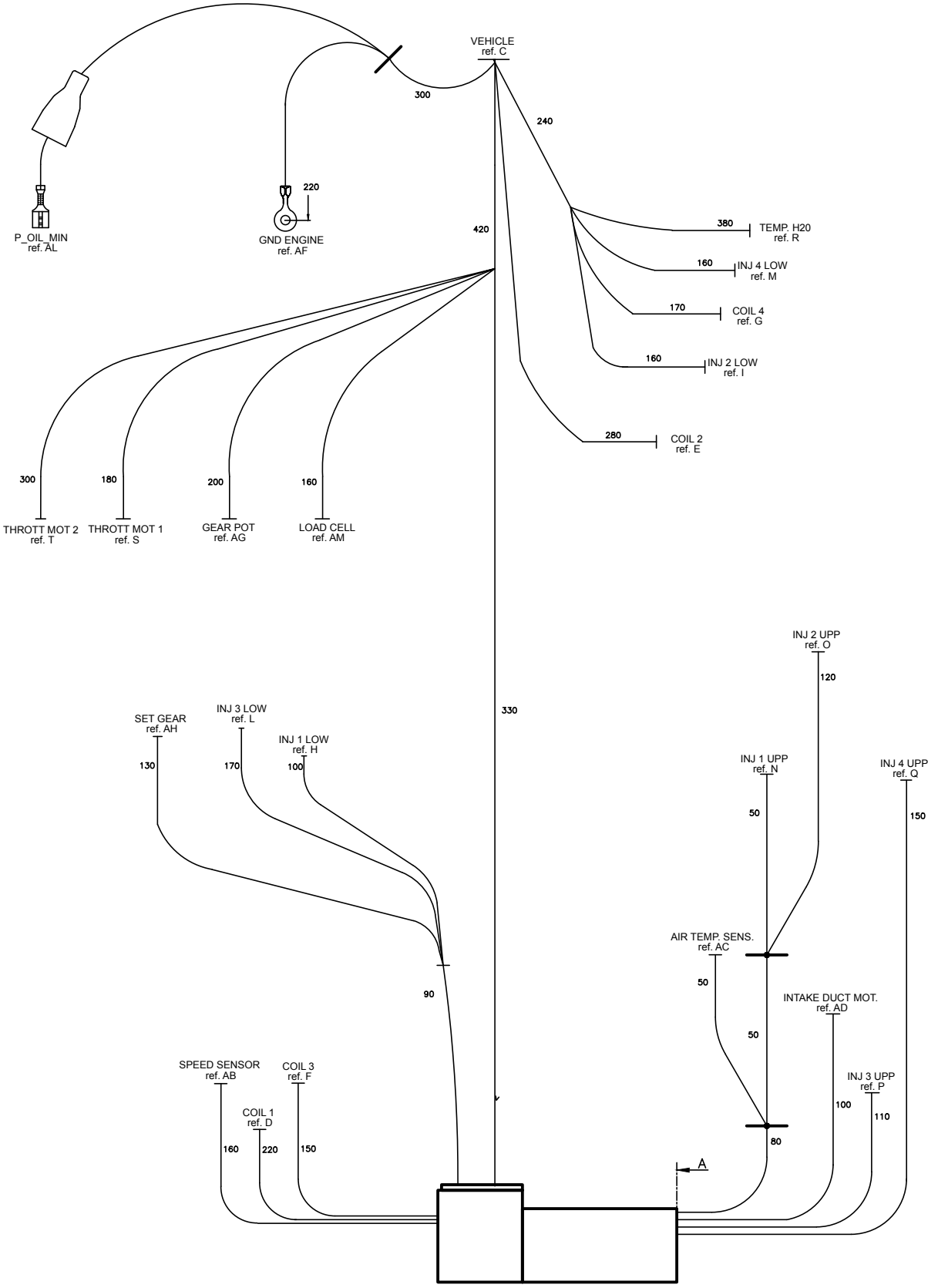
CABLES SIDE VIEW

INJ1-2-3-4 LOW/UPP	GEAR POT.
	

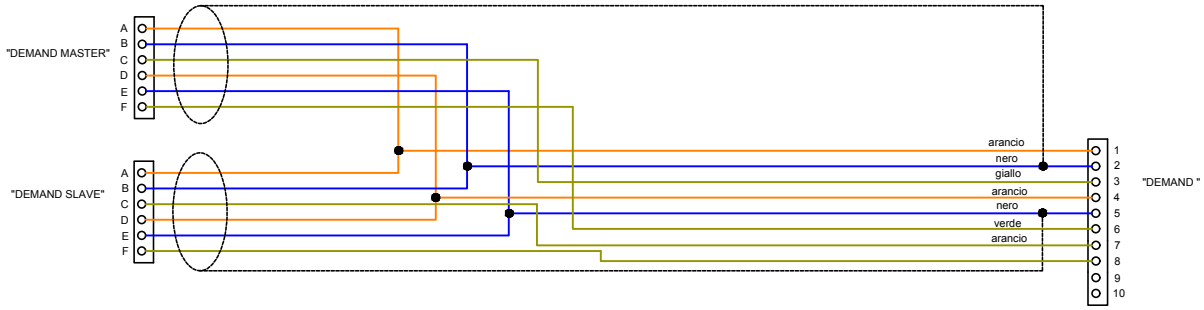
WIRE COLOR

Az = SKY BLUE
Bi = WHITE
Ar = ORANGE
G = YELLOW
Gr = GREY
B = BLUE
M = BROWN
N = BLACK
R = RED
Ro = PINK
V = GREEN
Vi = PURPLE

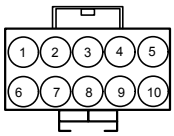
ENGINE SINGLE FILAMENT CABLE HARNESS

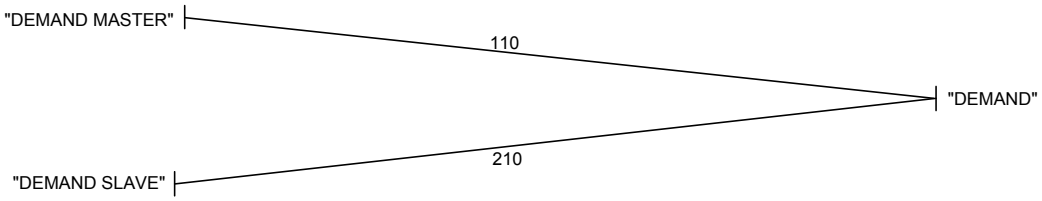


CABLE HARNESS DEMAND



DEMAND CONNECTORS - CABLES SIDE VIEW





Instrument panel

Matrix/RSS is the instrument panel of Aprilia Racing, which thanks to the wide LCD display and the analogue speedometer allows a clear visualisation of the engine and the parts of the information managed by the control unit APX2.

When the power supply to the electric circuit of the vehicle is activated, wait at least 3 seconds, as the entire electronic system performs the reset cycle.

When the instrument panel light will be on and when the rpm indicator needle is firmly set to zero rpm, it will be possible to start the engine..

Display

The instrument panel allows the visualisation of the information in two different windows:

MAIN: page always active during the normal operation of the motorcycle

PIT-LANE: is activated by pressing the BOX key on the LH push-button panel on the handlebar together with the speed limitation strategy in Pit-Lane

MAIN PAGE

key:

1. **GEAR** - Display of the engaged gear (from 0 to 6). 0 the idle.
2. **EB** - Engine brake level. H: HIGH; L: LOW (see PDA manual and section LEFT PUSH-BUTTON PANEL for the correct engine brake management)..
3. **MAP** - Engine mapping selection (1: DRY; 2: WET)
4. **TC** - TCS traction control level (from 0 to 7 - see PDA manual parameter RIDER L)
5. In the lower part of the display is a series of messages:

- "Lap time" - Visualisation of the lap time, for 60 seconds.
- RBW ERR - Problems at the RBW system, or at the throttle bodies.
- GAS ERR - The gas potentiometer does not work.
- TUN ERR - Any setting or implementation error of the gas, RBW, gear.
- TC ERR - The inertial platform is disconnected or not mounted correctly.
- E##: ## - 0..63. The specific error is indicated (consult the error table)
- "NEUT" - with the system on (supplied electric system) but the engine off indicates that the motorcycle is running. Safety that avoids the start-up of the engine until the gear is not put in the idle position, with following message cancellation.
- "LAUNCH" - indicates active start strategy, is cancelled when exiting the strategy

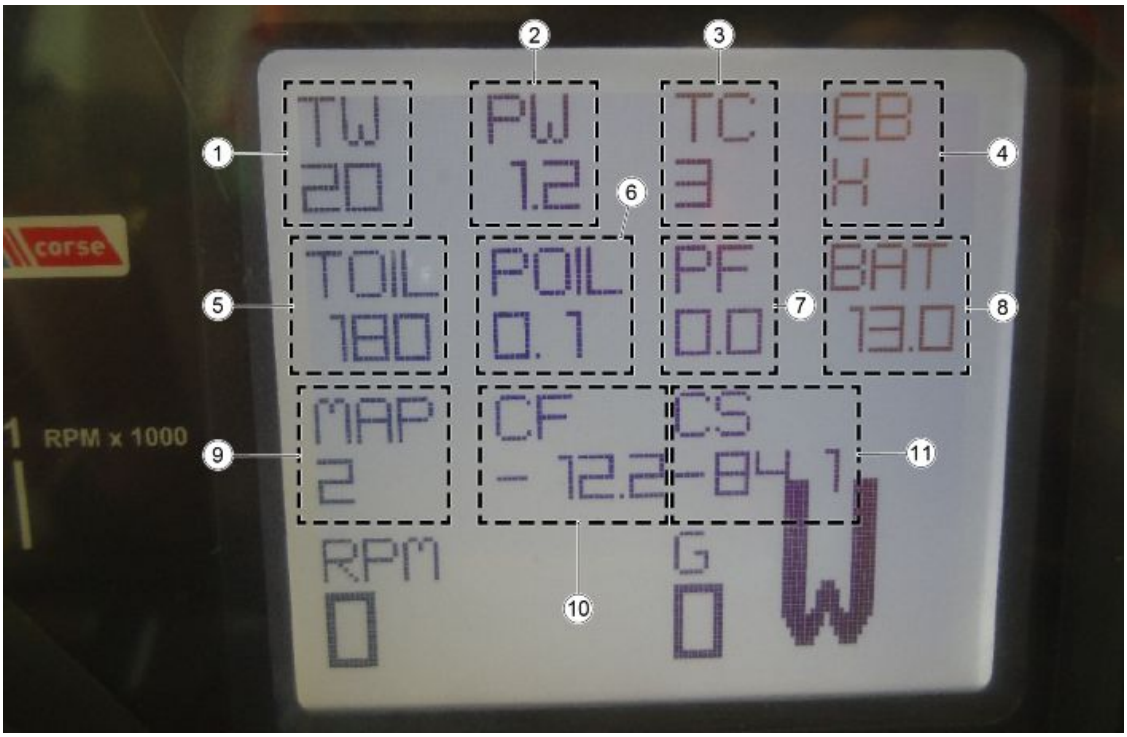
NOTE

THE ERROR MESSAGES HAVE THE PRIORITY BEFORE ALL OTHER MESSAGES.

PIT-LANE PAGE

key:

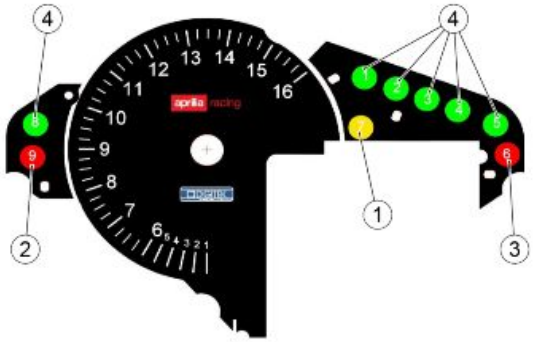
1. **TW** - Water temperature
2. **PW** - Water pressure (not active)
3. **TC** - TCS traction control level (from 0 to 7 - see PDA manual parameter RIDER L)
4. **EB** - Engine brake level H: HIGH; L: LOW (see PDA manual and section LEFT PUSH-BUTTON PANEL for the correct engine brake management)
5. **TOIL** - Engine oil temperature (NOT AVAILABLE)
6. **POIL** - Engine oil pressure (NOT AVAILABLE)
7. **PF** - Fuel pressure (NOT AVAILABLE)
8. **BAT** - Battery voltage
9. **MAP** - Engine mapping (1: DRY; 2: WET - shown also with message on bottom of display)
10. **CF** - Fork stroke (NOT AVAILABLE)
11. **CS** - Shock absorber stroke (NOT AVAILABLE)



LED indicator

key:

1. **ERROR ALARM LED** - Led that indicates the presence of errors
2. **LED PIT LIMIT** - Engaged "pit-limit" strategy activation signal
3. **LED n°6** - Not in use
4. **GEAR SHIFT SIGNAL LED** - Gear shifting signal LED, can be configured with PDA

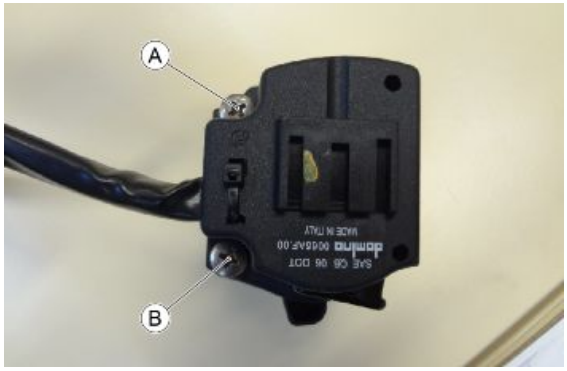


Change serial push-button panel

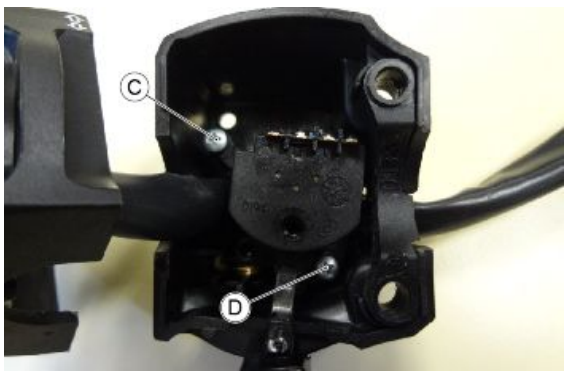
The left push-button panel mounted on the standard motorcycle needs some easy modifications to be used:

- Remove the "TURN INDICATOR LIGHTS CONTROL"

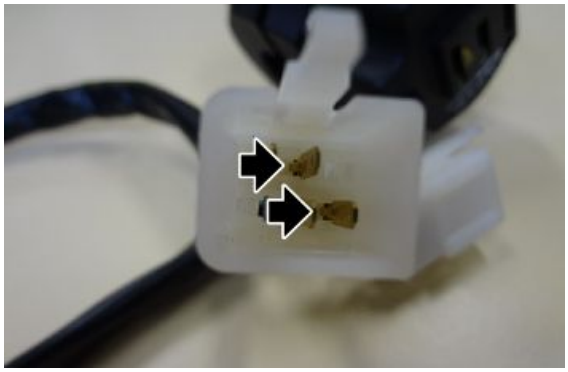
- Remove the screws A and B



- Open the block and remove the screws C and D



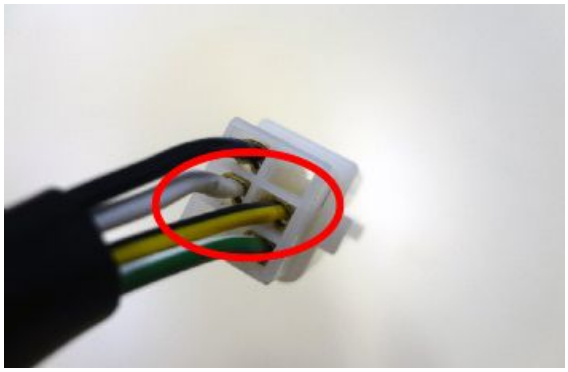
- Follow the wires of the push-button panel to the connector and remove the relative pins, except for the blue/black that must be cut.
- To extract the pin from the connector, the tab must be pushed downward as indicated in the figure and then removed from the connector pulling from the cable side



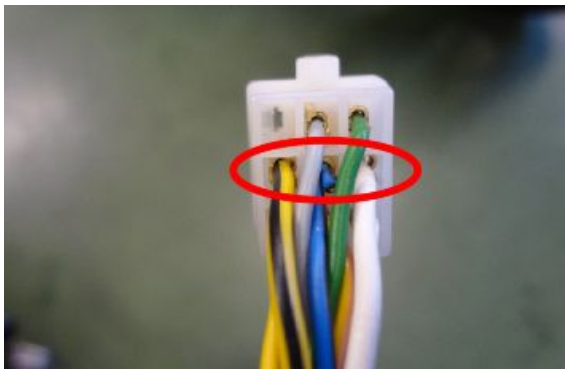
- Remove all the wires from the sheath and eliminate the push-button
- Close the block again by refitting the screws A and B

The second operation to be made is the modification of the pin-out of the connector

- Remove the WHITE and YELLOW/ BLACK wires from the 6-pole connector (or if of a different colour the ones in the same position of the ones indicated in the figure)



- Fit the two wires extracted in the 9-pole connector inserting them from under in the shown order



Thus modified the push-button panel, it is used for the following functions:

- TRACTION CONTROL adjustment (TCS)
- PIT LANE strategy activation
- Rear light activation
- ENGINE BREAKING strategy adjustment

Description left push-button panel

key:

1. **PIT** - Activation of the PIT LANE speed limiter - press the lower push-button. With the activation of the PIT-LANE strategy on the display appears the page "INFO"
2. **EB** - Pressing the push-button applies an offset, of fixed value in the control unit, to the ENGINE BRAKING value set in the page STRATEGIES→ENGINE BRAKING of the PDA. The operation is also shown on the instrument panel: **EB =H** (HIGH) sums a fixed offset in the control unit to the value of the PDA page to increase also the engine brake **EB =L** (LOW) offset equal to engine brake zero as shown in page ENGINE BRAKING of the PDA
3. **TCS** - Regulates the TCS control intervention level - to increase move the push-button to the right; to reduce move the push-button to the left. Corresponds to the parameter RIDER L page STRATEGIES→TCS of the PDA
4. **LIGHT** - Rear light activation - rear push-button

Description right push-button panel

key:

1. **RED PUSH-BUTTON**- SYSTEM ACTIVATION (HIGH) - pressing it to supply the electric system of the motorcycle

2. **MAP** - ENGINE START-UP - After supplying the electric system, pressing it starts the engine. MAP GEAR - with the engine running, allows to select one of the tow engine mappings available. On the instrument panel appears: 1: for the DRY curve; 2: for the WET curve;

INDEX OF TOPICS

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F. SETTINGS - TYRE

G. SETTINGS - INTAKE DUCT

H. SETTINGS - EXHAUST VALVE

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B. ENGINE - IDLE RBW_SP

C. ENGINE - LAMBDA START

D. ENGINE - K_INJ

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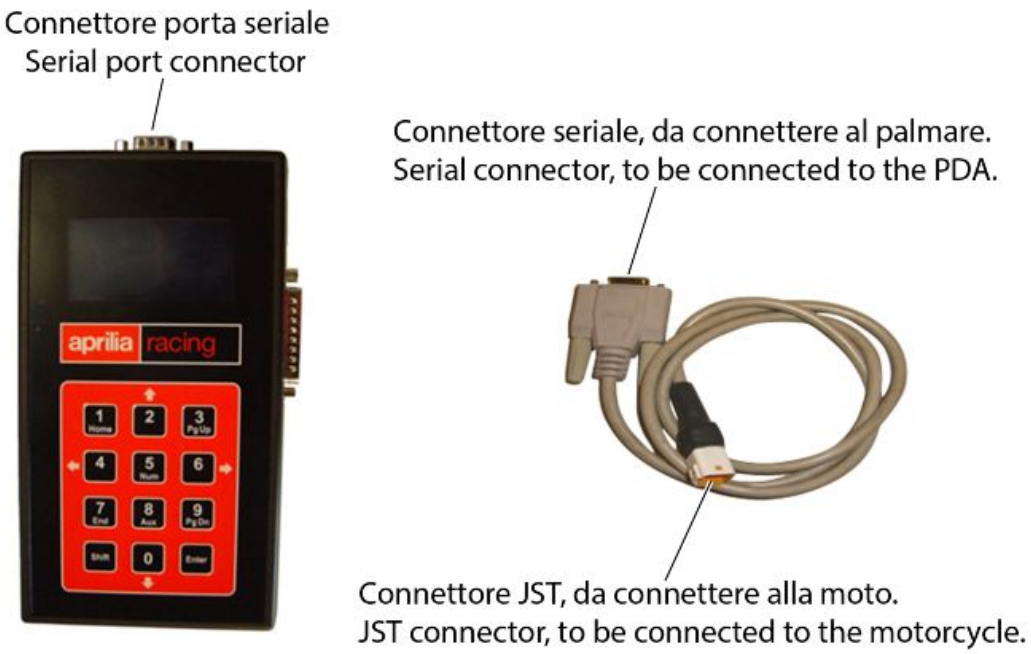
G. STRATEGIES - HTERRA

H. STRATEGIES - BACKLASH CTRL (ANTI-JERK CONTROL)

I. STRATEGIES - LAUNCH CTRL (ASSISTED LAUNCH CONTROL)

Introduction


Connettore porta seriale
Serial port connector
Connettore seriale, da connettere al palmare.
Serial connector, to be connected to the PDA.
aprilia racing
Connettore JST, da connettere alla moto.
JST connector, to be connected to the motorcycle.

The PDA is an interface between the user and the motorcycle ignition system. This allows to perform operations on the motorcycle control unit, such as the visualisation or the control of parameters necessary for the motorcycle functioning like: gear threshold, throttle valve, errors etc. It is recommended to connect the PDA to the motorcycle after the instrument panel has finished the reset procedure, when the rpm indicator needle is firmly set to zero. At the end of the operations, before starting the engine, disconnect the PDA. It may occasionally occur that, once the PDA is connected, incomprehensible characters appear on its display; in this case turn off the panel, disconnect the PDA and repeat the above described operation..

If during start-up the text "NO CAN CONNECTION" appears on the PDA display, it is necessary to set the connection speed of the PDA with the motorcycle control unit. This usually occurs when a PDA is used for the first time that was never used before.

The setting of the connection speed of the PDA is as follows:

1. On the display appears "NO CAN CONNECTION";
2. Simultaneously press the keys "Shift" and "1 Home";
3. With the low arrow (key 9) go to "Settings" and press "Enter";
4. Press "Enter" when the item "CAN" appears;
5. When the item "BaudRt" appears, press the left arrow (key 4) and the value 1 M turns to 500 K;
6. At this point press the key "1 Home" until returning to the main menu, where the item "EXIT" appears, using the low arrow (key 0) move to "EXIT" and press "Enter";
7. Once this is done, turn the system off and on again. If all these procedure are performed correctly, the main screen of the system appears.

When connecting the PDA, a test of the internal functions will be performed on the motorcycle. On the display appears for some seconds the following screen, after a moment followed by the Main menu page or by the one with the errors, if present in the ECU

KEYBOARD USE

In this section the keyboard functions are shown in detail.

The following figure shows the PDA keyboard.

FUNCTIONS OF THE KEYS

key "1" (Home): Returns to the previous menu.

Key "2": Moves the cursor up.

Key "3" (PgUp): Returns to the previous page.

Key "4": Decreases the value

Key "5": Not used

Key "6": Increases value.

Key "9" (PgDn): Goes to the next page.

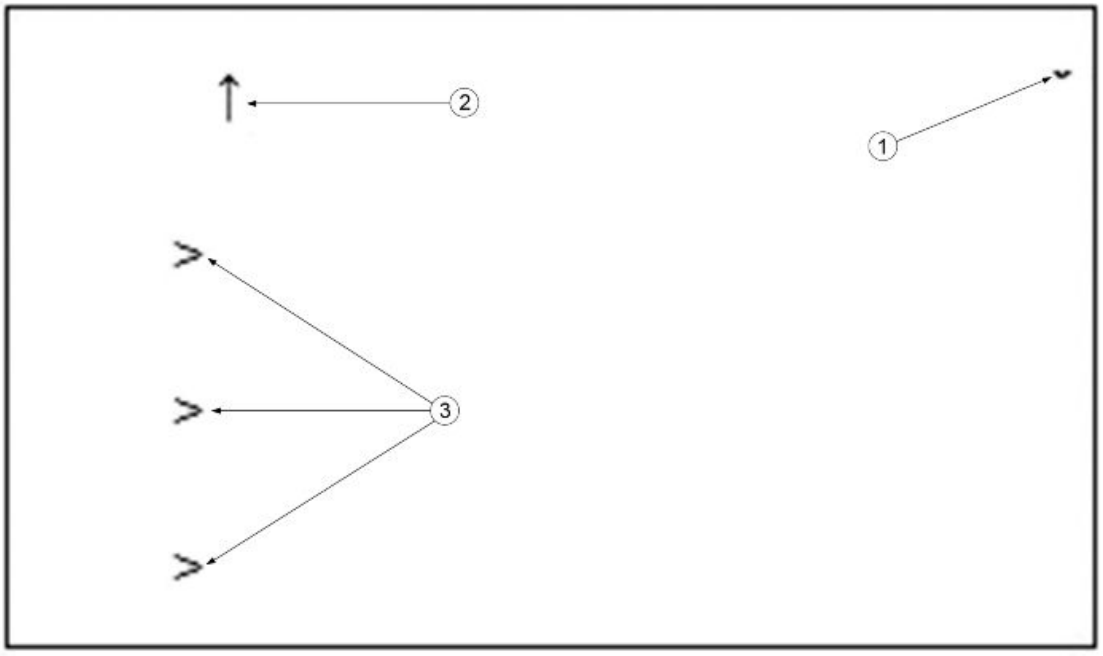
"Enter" Key: Confirm.

Key "0": Moves the cursor down.

"Shift" Key: Decreases value.

SYMBOLS IN THE DISPLAY

On the display the following symbols/icons can be found (in the following the corresponding explanations are indicated):



ICON LEGEND IN DISPLAY

1	Indicates that there is information on the next page.
2	Indicates that there is information on the previous page.
3	Indicates the line on which the cursor can be positioned. When flashing, it indicates the line on which the cursor is positioned.

Structure of the PDA menu

In the following a short list of all functions available in the PDA.

NOTE

THIS COULD VARY DEPENDING ON THE FIRMWARE VERSION.

-SETTINGS

- GEAR
- GAS
- RBW
- SENSOR
- INERTIAL PLATFORM
- TYRE
- INTAKE DUCT
- EXHAUST VALVE

-ENGINE

- CURVE
- IDLE RBW SP
- LAMBDA START
- K INJ
- AIR PRESS SET
- RPM LIMITER
- INT. DUCT OPEN

-MONITOR

- Real time view

-PARAMETERS

- GEAR-FLASH
- GEAR-SHIFT
- BEACON
- LAP SHIFT
- VIRTUAL BEACON
- SESSION
- PIT LANE
- WHEEL CIRCUM
- WHEEL TEETH

-ERRORS

- Shows possible errors

-STRATEGY

- TCS
- ADAPTIVE_TCS

- DISTANCE BASED
- ENGINE BRAKING
- POWER REDUCT.
- WHEELIE CTRL
- HTERRA
- BACKLASH CTRL
- LAUNCH CTRL

Description PDA pages

First page

As previously anticipated, when connecting the PDA, a test of the internal functions is carried out to search for possible errors.

- If there are no errors in the memory, the first page, as an example, will be the following:

SW: indicates the engine control firmware version.

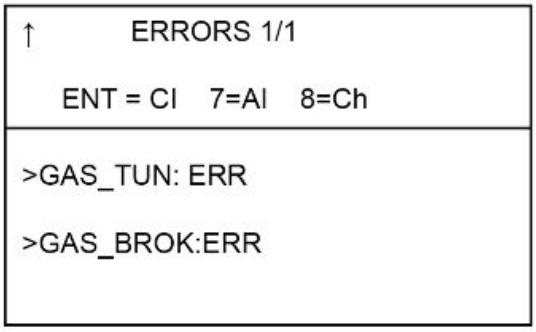
TYPE: type of motorcycle used in this configuration.

CFG: the name of the engine configuration in the control unit.

NOTE

PRESSING ANY KEY ENABLES THE ACCESS TO THE MAIN MENU

- If errors are detected during the initial test, a different page with a report of each error will appear. This is the "ERRORS PAGE". The abbreviation ERR appears on the right of the channel that caused the malfunction. See example:



The second line at the top shows the different operations that can be made:

- ENT = CI Indicates that pressing the ENTER key cancels the error of the selected line
- 7 = CI Indicates that pressing the key 7 cancels contemporary all errors in the memory
- 8 = Ch Situation update of errors in control unit

If the error persists after turning the system off and on again , go to the "SETTING PAGE" and check the parameters related to the errors/ signal/s.

NOTE

ONCE THE ERROR IS RESOLVED, BY PRESSING THE KEY "ENTER" IT IS POSSIBLE TO RETURN TO THE MAIN MENU

MAIN MENU

From the initial page, press any key to go to the MAIN MENU consisting of:

1. SETTINGS
2. ENGINE
3. MONITOR
4. PARAMETERS
5. ERRORS
6. STRATEGY

To access any of these items, just move the cursor to the desired line and press "ENTER".

NOTE

IT IS ALWAYS POSSIBLE TO RETURN TO THE "MAIN MENU" PRESSING THE KEY "HOME"

Settings

Below a detailed explanation of the different options:

These settings are regarding the essential sensors or devices and will be set up before being able to use the motorcycle:

A. SETTINGS - GEAR

B. SETTINGS - GAS

C. SETTINGS - RBW (to be performed first)

D. SETTINGS - SENSOR (only for systems supplied with Data acquisition)

E. SETTINGS - INERT.PLATFORM

F. SETTINGS - TYRE

G. SETTINGS - INTAKE DUCT

H. SETTINGS - EXHAUST VALVE

NOTE

THE FIRST OF THE CALIBRATIONS TO BE DONE IS THE ONE OF THE THROTTLE VALVES "RBW", OTHERWISE, WITHOUT THE CORRECT SETTINGS, THE ENGINES OF THE THROTTLE VALVE COULD BE FORCED ON THE END-STOP AND RISK TO DAMAGE IT

A. SETTINGS - GEAR

This sub-menu is divided in:

1. GEAR THRESHOLD
2. GEAR RATIOS
3. GEAR TYPE (DO NOT USE)

1. SETTINGS - GEAR - GEAR THRESHOLD

In this page it is necessary to set-up the gear potentiometer thresholds for each gear, so the ECU can recognise the correct ratio inserted. Also this is a very important operation for the correct operation of

the motorcycle, therefore it is ESSENTIAL to set them every time operations on the gear or on the corresponding potentiometer are made. The page that appears when pressing [ENTER], when the cursor is placed on "GEAR TUNING" is the following:

GEAR THRS	
cnt val:	8890 (es:1°)
> 1 INS:	9320
> 2 INS:	4200
> 3 INS:	28800
> 4 INS:	23950
> 5 INS:	19110
> 6 INS:	14260

NOTE

THE VALUES AS IT CAN BE SEEN DO NOT FOLLOW A MATHEMATICAL ORDER, BUT THIS IS ABSOLUTELY NORMAL. THE ABOVE INDICATED VALUES CAN BE CONSIDERED FOR REFERENCE.

"cnt val" indicates the value in "Real Time" (of in count) of the potentiometer. The values on the right of each gear are the ones saved in the control unit. When entering this page, the value related to the 1st gear will blink and indicate that it is ready to be saved by pressing the key "ENTER".

Now the first gear must be engaged mechanically, and by pressing "ENTER" the value in count ("cnt val") of the first gear will be saved in the ECU.

At this point the value in ("cnt val") and the value saved at the right of 1↑INS related to the first gear must match.

By pressing the key "0" it will move to the value in count of the second 2nd gear, the 2nd gear will be engaged mechanically and as it was made previously, the "ENTER" is pressed.

Repeating this procedure for each gear it will be necessary to set-up the values of the gear for all the gears up to the 6th gear.

The idle is saved automatically.

Once all the thresholds of the gear are set-up, check by engaging each gear mechanically that the value "cnt val" and the related saved value for each gear match.

Press [Home] to return to the menu GEAR SETTING

2. SETTINGS - GEAR - GEAR RATIOS

In this page the Ratio of the Primary drive (P), the Final ratio (F) and the Gear ratio for each gear (1-6) must be set-up, keeping in mind that:

1: The ratio of the primary drive remains fixed and shall then not be modified.

2: The final ratio (pinion / rim) depends on the user preferences and is inserted time by time.

3: The ratio of each gear depends on the type of gear inside the engine.

4: A wrong setting of the gear ratio can affect the correct operation of the TCS.

GEAR RATIOS	
P Z1:73	Z2:44
F Z1:16	Z2:41
1 Z1:15	Z2:39
2 Z1:16	Z2:33
3 Z1:21	Z2:34
4 Z1:21	Z2:31
5 Z1:23	Z2:31
6 Z1:27	Z2:34

The values of this table can be considered as reference for the engine version 2015 RR and RF and are not modified if the gearboxes remain the standard ones.

P: Primary gear ratio

F: Final ratio

1-6: Gear ratio

To move the cursor between Z1 and Z2 use the keys [2] and [0], and the same to pass from P (Primary) to F (Final). Once the cursor is in the desired positioned, a new value can be set-up using the keys [4] and [6].

Press [Home] to return to the menu GEAR SETTING

3. SETTINGS - GEAR - GEAR TYPE

This menu is not used, The default values **(Reduct: No for all gears)** set in this menu are not modified in order not to compromise the correct functioning of the motorcycle.

B. SETTINGS - GAS

In this page it is necessary to perform the calibration (tuning) of the throttle control (Demand), storing in the control unit (ECU) a reference to the throttle when it is fully closed and when it is fully open. The page appears by choosing in the menu SETTINGS the option "GAS". It must be kept in mind that because of safety reasons the motorcycle provides 4 potentiometers (Gas/Gas-Aux and

TUN.	GAS1	AUX
CNT:	850	48450
>0 %	850	48450
>100 %	3110	13375

Gas2/Gas2-Aux) contained in the same box (Demand). All four potentiometers are set in the ECU with the one procedure shown below.

To set-up the position to closed throttle:

- Put the cursor to 0% (blinking)
- Leave the throttle grip in rest position (0%)
- Press the [ENTER] key

In this way we have set the count to 0%, the values Cnt must correspond to the saved relative values at gas 0.

TUN.	GAS1	AUX
CNT:	3110	13375
>0 %	850	48450
>100 %	3110	13375

To set-up the position to fully open throttle:

- Put the cursor to 100% (blinking)
- Keep the throttle grip in completely open position (100%);
- Press the [ENTER] key

In this way we have set the count to 100%, the values Cnt must correspond to the saved relative values at gas 100.

Moving with the key [PgUp (3)] e [PgDn (9)] at the corresponding page the second group of gas potentiometers (Gas2) is accessed, where the values that were automatically saved during the setting of Gas1 can be displayed. It not necessary to repeat the operation.

TUN.	GAS2	AUX
CNT:	25090	6400
>0 %	25090	6400
>100 %	5825	25280

The values shown in this table can be considered for reference

NOTE

THE VALUE IN "COUNT" OF GAS1 MUST BE HIGHER THAN 810 "COUNT" IF THE THROTTLE IS AT 0%, AND LOWER THAN 3265 "COUNT" WHEN THE THROTTLE IS AT 100%. IF NOT DONE, IT IS NECESSARY TO ADJUST THE POSITION OF THE ADJUSTERS OF THE THROTTLE CABLES.

If you make any errors during the calibration, on the instrument panel appears TUNING ERROR and an error message (GAS TUN:ERR) in the page ERRORS appears on the PDA.

C. SETTINGS - RBW

NOTE

THIS SETTING MUST BE CARRIED OUT AS SOON AS POSSIBLE AFTER STARTING THE SYSTEM

This page allows the automatic setting of the values of the Ride by Wire.

The operation is made by only pressing the key [7], the control unit will register the values corresponding to the minimum and maximum of the throttle valves opening of the throttle bodies 1 (Rear) and 2 (Front) closing and opening them automatically. (The above indicated values can be considered for reference). This procedure takes about 20 seconds.

With this operation are set the values of the two throttle bodies. For the throttle body 2 (Front) it is possible to verify the setting values by moving with the key [PgDn (9)] in the page FARF2.

TUN.	FARF1	AUX
CNT:	640	55425
>0 %	415	59055
>100 %	3945	2480

TUN.	FARF2	AUX
CNT:	635	55360
>0 %	410	58990
>100 %	3925	2675

The values shown in this table can be considered for reference.

If you make any errors during the calibration, on the instrument panel appears RBW ERROR and an error message (RBW TUN:ERR) in the page ERRORS appears on the PDA

D. SETTINGS - SENSORS

The entire sub-menu "Sensor" is about the systems with Data acquisition and is treated separately.

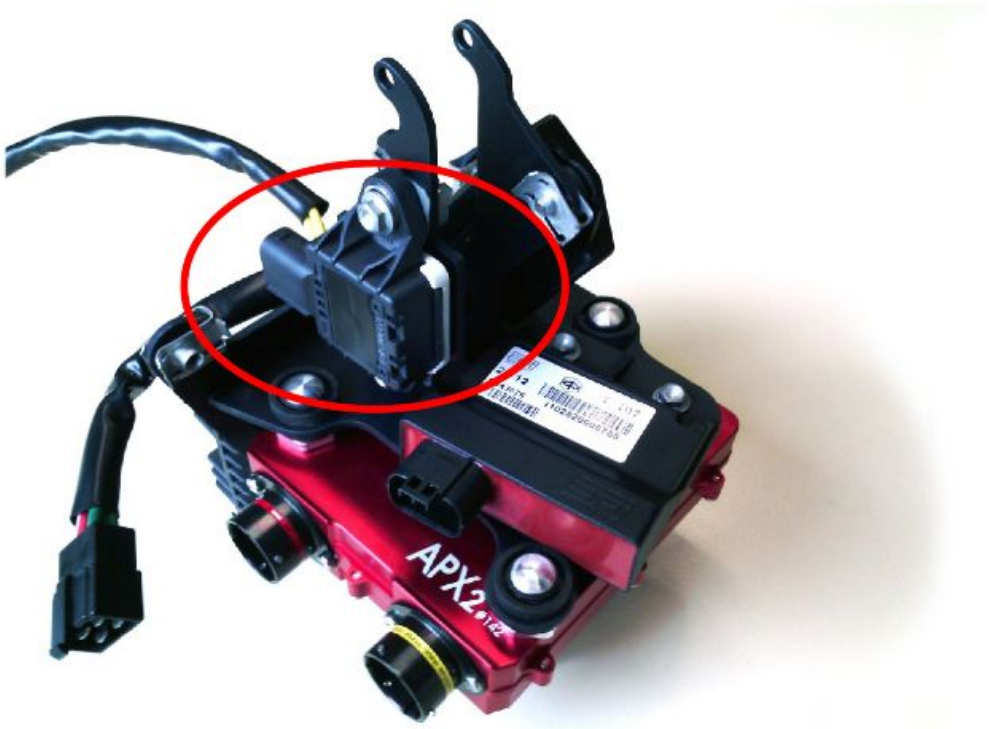
E. SETTINGS - INERTIAL PLATFORM

The inertial platform must be fitted as in the figure and the setting from the PDA must be as follows:

MOUNT2011:1

NOTE

1: MODIFYING THIS SETTING CAUSES INCORRECT FUNCTIONING OF THE TCS.
2: MOVING AND/OR MODIFYING THE POSITION OF THE INERTIAL PLATFORM CAUSES INCORRECT FUNCTIONING OF THE TCS



F. SETTINGS - TYRE

This operation allows to set the wheel parameters in case of different weather conditions:

WET		DRY	
FRONT	REAR	FRONT	REAR
0	1	6	7

G. SETTINGS - INTAKE DUCT

Command not enabled

H. SETTINGS - EXHAUST VALVE

Command TUNING Exhaust valve. Not present in the motorcycle versions SST. DO NOT USE

Engine

In the menu' "ENGINE" are the following sub-menus:

A. ENGINE - CURVES

B. ENGINE - IDLE RBW SP

C. ENGINE - LAMBDA START

D. ENGINE - K INJ

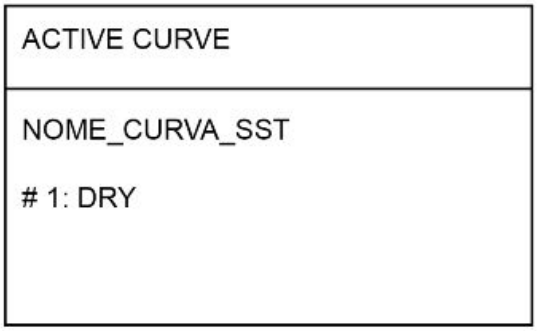
E. ENGINE - AIR PRESS SET

F. ENGINE - RPM LIMITER

G. ENGINE - INT. DUCT OPEN

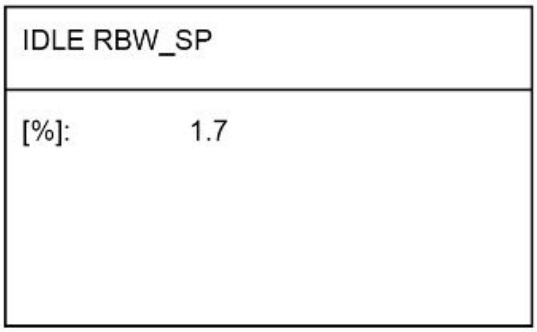
A. ENGINE - CURVE

Inside the control unit, an engine curve for the dry track conditions (DRY) and a curve for the wet track conditions (WET) are pre-set. This option, by acting on the push-buttons [4] and [6] of the PDA, allows to select the desired one.



B. ENGINE - IDLE RBW_SP

This parameter indicates the opening % of the throttle valve at idle speed. Modifying this value it is possible to raise or lower the engine at idle, which should remain within 2300-2500 Rpm.
The modification must be max +\- 0.2% each time.



C. ENGINE - LAMBDA START

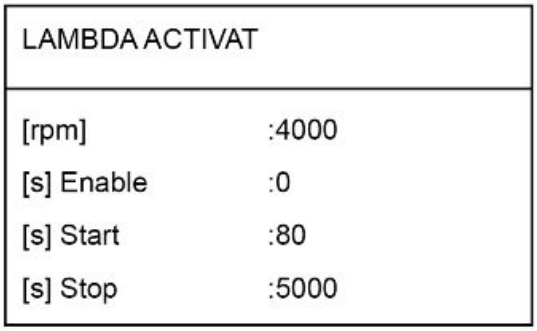
key:

[rpm]: indicates the engine speed in rpm, at which the lambda probe (if present) is activated. The activation of the lambda probe is also done when the time strategy (described below) is disabled.

[s]Enable: 0 disables the lambda activation control with "time" strategy. 1 enables the lambda activation control with "time" strategy.

[s]Start: delay seconds for the activation of the lambda after verifying the "rpm" condition

[s]Stop: time period till the lambdas turn off



D. ENGINE - K_INJ

Adjustment: 50....150

Recommended parameter 100 (%) for each cylinder.

NOTE:

Value = 100 % : to use the set value of the map

Value > (over) 100 % : to increase the injection time (reduction of the stoichiometric ratio A\F)

Value > (under) 100 % : to decrease the injection time (increase of the stoichiometric ratio A\F)

NOTE

THESE VALUES ARE MULTIPLIER COEFFICIENTS % AND ALLOW TO LEAN OR RICHEN THE CARBURATION OF EACH CYLINDER.
IF FOR EXAMPLE ON CYL 1 IS WRITTEN: 105 IT WILL GROW 5% COMPARED TO THE BASIS MAP THE CYLINDER NUMBER 1, IF YOU WANT TO LEAN 5% WRITE 95% INSTEAD.
THIS TYPE OF MODIFICATION IS A VERY DELICATE OPERATION, AS IT CAN CAUSE LOSS OF PERFORMANCE OR EVEN IRREVERSIBLE DAMAGE TO THE ENGINE. THEREFORE IT SHOULD ONLY BE MODIFIED BASED ON THE READING OF THE LAMBDA PROBE (IF INSTALLED).

K INJ [%] CYL	
1: 100.0	2: 100.0
3: 100.0	4: 100.0

E. ENGINE - AIR PRESS SET

key:

[mbar]: This page allows to indicate the air press in the circuit to the system, so based on an algorithm it can make the necessary carburetion corrections.

[Speed Min]: This is the minimum speed to above which, through an algorithm, will be calculated the "virtual" atmospheric pressure such as to make the appropriate changes to the injection timing depending on the speed. (This parameter does not need any modification).

PAIR	
[mbar]:	1000
Speed Min:	80

F. ENGINE - RPM LIMITER

This page allows to set the value in Rpm of the Rpm limiter for each gear, the recommended value not to be exceeded for the version SST is 14000 Rpm.

Exceeding this value leads to more frequent maintenance intervals and reduces the mechanical reliability.

RPM LIMITER	
1 <->	14000
2 <->	14000
3 <->	14000
4 <->	14000
5 <->	14000
6 <->	14000

G. ENGINE - INT. DUCT OPEN

This page allows to set-up the opening parameters of the duct with adjustable height of the throttle bodies.

INT. DUCT OPEN	
THR%: 90.0	H: 5.0
RPM: 12800	H: 1000

key:

Thr%: indicates the throttle threshold value after which the intake duct opens, while H is the related hysteresis

THR%: 90.0 DO NOT MODIFY

H = 5.0 DO NOT MODIFY

RPM: indicates the engine rpm value after which the intake duct opens, while H is the related hysteresis.

RPM = 12800

H = 1000 DO NOT MODIFY

The intake ducts only open when the two conditions of rpm and throttle are verified

Monitor

This page allows to display in "real time" the essential parameters of the motorcycle like rpm, throttle, engaged gear etc. and it can be navigated through the various menus using the key arrows [2] and [0], or [PgUp (3)] and [PgDn (9)].

For some items it is possible to read the correspondent in Counts pressing the key ENTER

Parameters

A. PARAMETERS - GEAR-FLASH

B. PARAMETERS - GEAR-SHIFT

C. PARAMETERS - BEACON

D. PARAMETERS - LAP-SHIFT

E. PARAMETERS - VIRTUAL BEACON

F. PARAMETERS - SESSION

G. PARAMETERS - PIT LANE

H. PARAMETERS - WHEEL CIRCUM

I. PARAMETERS - WHEEL TEETH

A. PARAMETERS - GEAR - FLASH (GEAR SHIFT LED SETTINGS)

This page allows to set-up the rpm speed for each gear, at which the gear shift led on the instrument panel lights up.

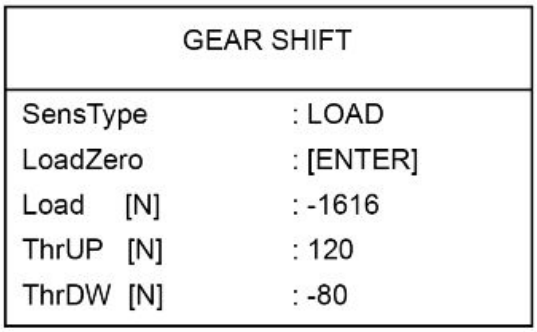
Usually it is recommended to set them to 500/600 Rpm before the limiter.

(E.g. Lim. = 13800)

RPM FLASH	
1 <->	13400
2 <->	13400
3 <->	13500
4 <->	13500
5 <->	13600
6 <->	14000

B. PARAMETERS - GEAR-SHIFT (GEAR SHIFT SETTINGS)

This page allows to set-up the different parameters related to the Electronic Gear Shift system.



NOTE

THE VALUES SHOWN IN THE FIGURE ABOVE MUST BE CONSIDERED AS INDICATIVE

key:

SensType: gear shift typology setting

- Set = With sensor on mechanical gear rod (Standard)
- OnlyPot = With exclusive use of the gear potentiometer (No SST)
- Load = With use of a load cell supplied separately

The potentiometer of the gear and the mechanical sensor on the rod of the gear are always installed on the motorcycle, while the fitting of the load cell is optional and also allows assisted downshift (blipper \kicker strategy).

The below parameters are to be considered only in presence of the load cell fitted on the gear lever

LoadZero: Load cell reset. With the load cell in rest position (not loaded) press the key [ENTER] to reset the value of the loaded load cell

ThrUP and ThrDW: they allow to reset the cell and to set the thresholds, expressed in Newton, of system intervention, selecting the loads both in gear shift as well as downshift.

Usually the thresholds are the following:

With gear RACING (1st gear up)

ThrUP (N) : 120 = about 12 Kg

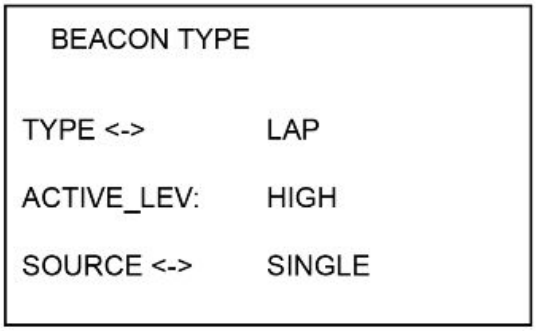
ThrDW (N) : -80 = about 8 Kg

With road gear (1st gear down)

ThrUP (N) : -120 = about 12 Kg

ThrDW (N) : 80 = about 8 Kg

C. PARAMETERS - BEACON (BEACON SETTINGS)



TYPE: "Sector" if only one activator exists (usually on the beacon line) or "Lap" in presence of two transmitters on the beacon line and various transmitters in correspondence of various circuit sectors.

ACTIVE_LEV: is relative to the type of electric signal supplied by the receiver, HIGH = high and LOW = low.

SOURCE:

- SINGLE : usable option (beacon trigger single signal)
- WIDTH : option not usable
- CAN : option not usable

D. PARAMETERS - LAP-SHIFT (BEACON SHIFTING)

This setting allows, if a beacon is installed, to virtually move the position of the transmitter regarding its physical position by entering a value expressed in meters.

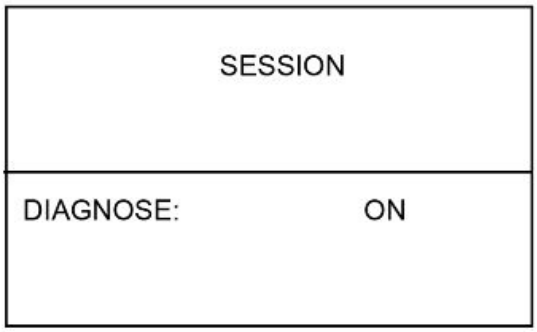
Once the signal is received, a meter counter starts, and as soon as the set value is reached it triggers the lap cut on the motorcycle.

Usually this value is left at zero and must always and only be positive.

E. PARAMETERS - VIRTUAL BEACON

Setting not used by the SST system

F. PARAMETERS - SESSION (COMPETITION/ CLASSIFIED SESSION SETTING)



CAUTION

SETTING USUALLY SET TO ON, IS RELATED TO THE ACTIVATION OF A DIAGNOSTIC SYSTEM THAT TURNS OFF THE ENGINE WHEN THE OIL PRESSURE IS MISSING. THIS SERVES TO PROTECT THE ENGINE AND RIDER SAFETY. SETTING THIS OPTION TO OFF, SUCH SYSTEM IS DEACTIVATED BECAUSE OF THE RISK AND DANGER TO THE USER.

G. PARAMETERS - PIT_LANE (PIT LANE)

These parameters allow to set the maximum travel speed of the motorcycle in the pit lane, as in the regulation.

SPEED_LIM: speed in Km/h above which the limiter intervenes

LENGTH: is the length in meters beyond which the system is disabled.

CAUTION

IN EVERY CASE THE SYSTEM IS ONLY ACTIVE IN FIRST GEAR - WHEN THE SECOND GEAR IS ENGAGED THE CONTROL DISENGAGES AUTOMATICALLY.

PIT LANE	
SPEED_LIM:	
[km/h]:	59
LENGTH[m]:	700

H. PARAMETERS - WHEEL CIRCUMF (WHEEL CIRCUMFERENCE)

This page allows the modification of the circumference values of the F (front) and R (rear) wheels.

The parameter "USE CLF" MUST REMAIN STRICTLY SET TO "YES".

The values in millimetres F and R are fix, but it is possible to set different wheel circumference values by changing the respective Gain as following. The final value of the circumference will be given by 1900X G (1.000) and 2064X G (1.00).

EXAMPLE:

Desired front wheel circumference value to be set to 1950 mm;.

Value G (relative gain to be set) = Desired value 1950: Fix value (F)1900= 1.026

These settings are essential for the correct functioning of the TCS.

WHEEL CIRCUMF	
F:1900 mm:	G:1.000
R:2064 mm:	G:1.000
USE CLF:	YES

I. PARAMETERS - WHEEL_TEETH (TEETH FOR THE WHEEL SPEED DETECTION)

Do not modify the values in the figure.

WHEEL TEETH
Fr : 6
Rr : 5

Errors

This important page is related to the display of possible errors in the control unit and is displayed at system start, if there are errors.
The possible items to be displayed are:
SPEED_FR:ERR Front speed sensor reading error
SPEED_RR:ERR - Rear speed sensor reading error
GAS TUN:ERR Error during calibration of the throttle control
POIL LOW:ERR Oil pressure too low
RBW TUN ERR: - Error during calibration of RBW (driven throttle valve)
INPLAT_CAN ERR: - Inertial platform error (disconnected or damaged)
TCS ERR: - TCS error (only verified after a drop)
VBATT ERR: - Error related to a too low battery voltage (the error can be verified also after a start-up with empty battery)
GAS ERR: - Error on the gas potentiometer reading
GAS AUX ERR: - Error on the AUX gas potentiometer reading
THROT1 ERR: - Throttle valve 1 potentiometer error (REAR BANK)
THR1 AUX ERR: - Throttle valve 1 AUX potentiometer error
TROT2 ERR: - Throttle valve 2 potentiometer error (FRONT BANK)
THR2 AUX ERR: - Throttle valve 2 AUX potentiometer error
Once the cause of the error is identified it can be deleted from the memory going with the arrows to the line containing the error and pressing the key "ENTER".
It is possible, in case of more errors, to delete all of them at the same time by pressing the key "7".
When the cause of the error was resolved the error page results empty when turning the system off and on again.

Strategies

In this sub-menu all the motorcycle control systems are gathered together:

A. STRATEGIES - TCS

B. STRATEGIES - ADAPTIVE_TCS

C. STRATEGIES - DISTANCE BASED

D. STRATEGIES - ENGINE BRAKING

E. STRATEGIES - POWER REDUCT.

F. STRATEGIES - WHEELIE CTRL

G. STRATEGIES - HTERRA

H. STRATEGIES - BACKLASH CTRL

I. STRATEGIES - LAUNCH CTRL

A. STRATEGIES - TCS (TRACTION CONTROL)

This page allows to set the parameters for the TCS management. There are two parameters that can be configured by the user:

TCS	
LEVEL	: 0.0
RIDER L	: 4
SLIP1_C	: 0.005

RIDER L: (SELECTABLE LEVEL BY THE RIDER)

Indicates the traction control value set-up regarding a scale from 0 to 7.

0 equivalent to Turn off the system and 7 is the maximum possible control.

Usually it is set to 4.

This value, which is also displayed on the instrument panel, can be modified by the rider through the push-button panel on the left semi-handlebar, depending on the track conditions and the rider preferences.

Usually it is recommended to act only to increase the TCS level, as reducing the system action this can be dangerous.

RIDER L 0 - OFF

RIDER L 1 - Minimum level TCS

RIDER L 4 = TCS Standard level (dry track)

RIDER L 7 - Maximum level TCS

NOTE

PLEASE REMIND THAT PUTTING THIS VALUE TO 0 (ZERO) IS EQUIVALENT TO COMPLETELY TURNING OFF THE SYSTEM. HOWEVER, THE TCS ACTIVATES AUTOMATICALLY OVER 120 KM/H AND TURNS OFF UNDER 40 KM/H.

LEVEL: (TCS GENERAL OFFSET LEVEL)

This parameter allows to set an offset on the value RIDER L ("RIDER LEVEL") allowing to increase or reduce the general control value if also the maximum level (7) is not sufficient, e.g. at wet track.

Reducing the value "LEVEL" will increase the extent of the control

This value comes together with "RIDER L", and is set as follows:

LEVEL

LEVEL	RIDER L	
0	4	(STANDARD DRY TRACK)
-0.5	5	(STANDARD WET TRACK)

Obviously these will be start values, and based on the track conditions or the rider preferences, the level "RIDER_L" can be modified with the push-button panel on the handlebar.

SLIP1_C:

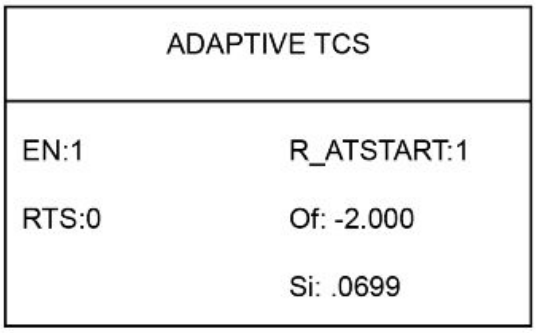
This parameter allows to modify the slip target. The modification of the parameter intervenes on the slope of the offset line on the value RIDER L ("RIDER LEVEL").

This value can variate inside the interval -0.015 and +0.015. For negative values the extend of the control increases for the positive values instead reduces.

B. STRATEGIES - ADAPTIVE_TCS (ADAPTIVE TRACTION CONTROL)

This function allows to activate an "Adaptive" traction control system, capable to adjust automatically depending on the track conditions, also in dry/ wet type variations.

The screen is as follows:



The set values are:

- EN: 0-1 Adaptive system (Enable)
- R_ATSTART: 0-1 (Reset values at each output)
- RTS : manual reset of the values

The values 0 is equivalent to "OFF", while the value 1 means "Enable"

Usually these two values are set to 1 (Enable) and it is recommended not to modify them, while the values "Of" and "Si are written by the control unit and cannot be modified.

C. STRATEGIES - DISTANCE BASED (DISTANCE BASED CONTROLS MODIFICATIONS)

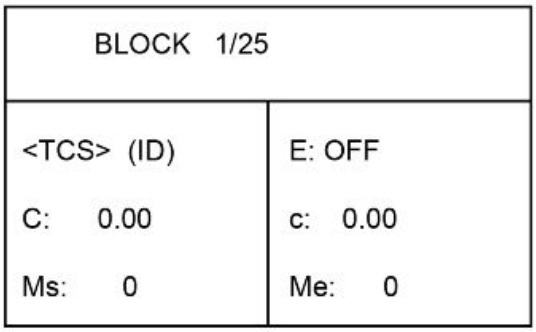
This system allows to modify different parameters, like TCS, Engine brake etc. in precise points of the path.

To do so, the system needs a beacon that divides the laps on the beacon lane, and a data acquisition system to allow to exactly identify the path points where to intervene.

If there is no beacon and Data acquisition system that allows to exactly know where the system must intervene, it is recommended to leave all distance based values at ZERO as set by Aprilia Racing, in order to avoid involuntary interventions.

Schematically the system has 25 sectors identified by a inlet threshold (Ms) and an output threshold (Me) expressed in meters.

For each sector it can be varied:



- TCS (Traction control)
- WHEELCTR (Anti wheeling control)
- ENG BRAK (Engine brake)
- PWR REDU (Engine reduction)
- PREV PWR (Preventive engine reduction)

key:

1. Lock is disengaged
2. Lock Engaged
3. Value to be modified
4. TRACTION CONTROL
5. ANTI WHEELING CONTROL
6. ENGINE BRAKING
7. ENGINE POWER REDUCTION
8. Parameter correction 1
9. Set a value to be added to the parameter LEVEL of the page STRATEGIES→TCS with variation step of +/-0.1
10. Set a value to be added to the parameter WC_COEFF of the page STRATEGIES - WHEELIE CTRL. Set variation step to +/-100
11. Set a value to be added to the engine braking values of the page STRATEGIES - ENGINE BRAKING. Refer to the description of the page later in the manual for the maximum allowed variation interval.
12. Set a value to be added to the values of the page STRATEGIES - POWER REDUCT. Refer to the description of the page later in the manual for the maximum allowed variation interval.
13. Parameter correction 2
14. Increase or reduce the value SLIP1_C of the page STRATEGIES - TCS with variation step of +/-0.01
15. Set a value to be added to the parameter OFF_V of the page STRATEGIES - WHEELIE CTRL. Set variation step to +/-10

EN:	OFF:	①
	ON:	②
ID:	③	
	TCS	④
	WEELCTRL	⑤
	ENG BRAK	⑥
	PWR REDU	⑦
C:	⑧	
	TCS	⑨
	WEELCTRL	⑩
	ENG BRAK	⑪
	PWR REDU	⑫
c:	⑬	
	TCS	⑭
	WEELCTRL	⑮
	ENG BRAK	⑯
	PWR REDU	⑰
Ms:	⑱	
Me:	⑲	

16. Not used, the parameter must be set to 0.
17. Not used, the parameter must be set to 0.
18. Start value Block in metres
19. End value Block in metres.

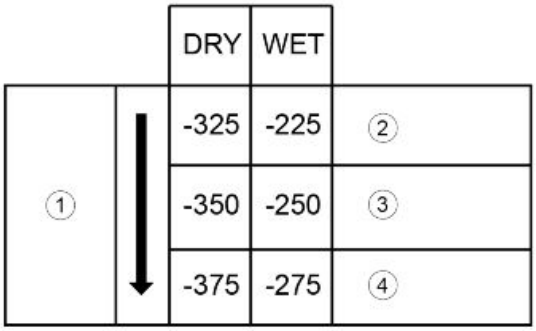
D. STRATEGIES - ENGINE BRAKING (ENGINE BRAKING CONTROL)

This page allows to set the Engine brake values expressed in [Newton] for each gear:

ENG BRAK En=1 (non modificare			
1:	-350	2:	-350
3:	-350	4:	-350
5:	-350	6:	-350

En = 1 Engine brake strategy ENABLED.
En = 0 Engine brake strategy DISABLED.
It is recommended not to modify this parameter and to start with the engine brake level as indicated by the table above, to then modify them depending on the rider and circuit needs. It might be necessary to deactivate the Engine brake ONLY for the workbench tests, but make sure to activate it again for the track use of the motorcycle.

The interval of allowed values for the engine braking varies if the dry (DRY) or wet (WET) curve is used



key:

1. Increases Engine Brake
2. Reduces engine brake - Minimum settable engine brake level
3. Recommended start value
4. Increases engine brake - Maximum settable engine brake level

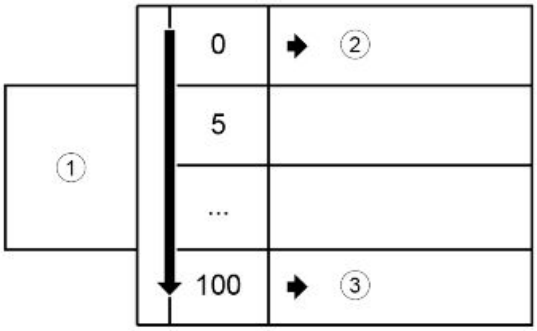
E. STRATEGIES - POWER REDUCT (POWER REDUCTION CONTROL)

This function allows to reduce the engine power to adjust it to the track conditions.
Usually this is used in the first gears (1st-2nd-3rd) to avoid excessive grip loss or wheeling to completely open throttle.
Avoid using this function in the higher gears (4th-5th-6th) in order not to loose engine performance.
Obviously the standard value is set to Zero, but depending on the needs it can be reasonable to bring it to a maximum of 50-60.
However setting the power reduction to 100 does not mean to completely cut off the engine power, but reduce it of the maximum granted, regarding a table inserted in the control unit.

POWER REDUCT			
1:	18	2:	10
3:	4	4:	0
5:	0	6:	0

key:

1. Maximum Reduction=Minimum Power
2. Maximum Power (No Reduction)
3. Minimum Power (Maximum Reduction)



F. STRATEGIES - WHEELIE CTRL (ANTI WHEELING CONTROL)

This page is related to the anti wheeling system adjustment parameters (WHEELIE CTRL). The values shown in the table can be considered for reference.

The available items are the following:

ENABLE: Activates the system if set to 1, while when set to 0, the system is disconnected.

It is recommended to leave this parameter to 1 for the track use.

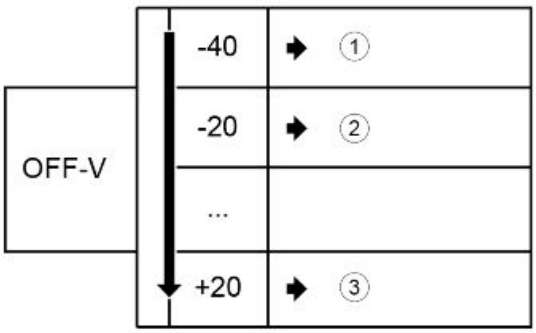
OFF-V: This parameter is a threshold value, compared to the zero standard, set in the control unit and expressed in °/sec of motorcycle wheeling (pitch up). When this value is negative (-20, -30 etc..) then the system will intervene by cutting off the power.

But increasing the value (e.g.: +10, +20 etc..) the extent of the intervention of the system will decrease.

WHEELIE CTRL	
ENABLE	1
OFF-V	-20
WC_COEFF	800
POWER_RED	15
LAUCH EN	1
LAU.OFF-V	-25
LAU.COEFF	900
LAU.P_RED	20

key:

1. Maximum Force
2. Reference
3. Minimum Force



WC_COEFF: (ANTI WHEELING CONTROL COEFFICIENT)

This parameter basically represents the torque limit transmitted to the wheel, above it the power will be cut off.

As this torque depends, other than on the engine, on the total transmission ratio and then on the engaged gear, it can be decided to intervene e.g. on the first gears and not on the others, as following:

1000 -1100 = only 1st gear

1000 = 1st and 2nd

800 = 1st, 2nd and 3rd (basic set up)

600 = 1st, 2nd, 3rd and 4th

Increase this value (e.g. 100, 200) to have less anti wheeling control to the other gears (3rd, 4th, 5th 6th), or reduce it (e.g. -100, -200) to have more anti wheeling control to the other gears (3rd, 4th, 5th 6th).

POWER_RED (POWER REDUCTION during the wheeling)

This value indicates the percentage extent (%) of the maximum power reduction during the intervention of the anti wheeling system.

As previously described for the "POWER REDUCTION", also in this case the power reduction value is not absolute, but percentage regarding a table in the memory of the ECU.

The following parameters LAU.oFF-V, LAU.COEFF, LAU P_RED refer all to the anti wheeling strategy relative to the Launch control. For all settings of the above mentioned parameters, see the general anti wheeling parameters

STRATEGIES - WHEELIE CTRL

G. STRATEGIES - HTERRA

Strategy not used by the SST system

H: STRATEGIES - BACKLASH\ANTIJERK CTRL (ANTI-JERK CONTROL)

This function is related to the power control during the first throttle opening phase, or when all transmission clearance is recovered.

Basically the possibilities of adjustment are the following:

ENABLE/TYPE:

- 0= OFF
- 1= STD
- 2= EVO3 (Last pre-set version)

It is recommended to leave option 2 set.

I. STRATEGIES - LAUNCH CTRL (ASSISTED LAUNCH CONTROL)ENABLE: ON

This option allows the enabling or not of the assisted launch system.

The system is automatically activated when the motorcycle has a speed under 10Km/h and the strategy "Pit-Lane" is disabled. On the instrument panel will be displayed the text "LAUNCH".

This system limits the maximum rotational speed at start, even if the throttle is completely open, and will automatically turn off 3 seconds after start; in any case the strategy is disabled after engaging the second gear.

It is recommended to leave the system in position ON as by the basic set-up.

INDEX OF TOPICS

PRELIMINARY PROCEDURES AND CALIBRATIONS	**PRO**

Index:

PRELIMINARY PROCEDURE

- BATTERY

- PHONIC WHEEL SPEED SENSORS

CALIBRATION

- GEARBOX

- GAS

- RBW

- GENERIC SENSORS

- SUSPENSION SENSORS

- AIR PRESSURE

- GEARBOX LOAD CELL (OPTIONAL)

The following preliminary procedures are necessary so that the use of the motorcycle is safe both for the driver and for the motorcycle. The calibrations are also important so that there are no anomalies or problems when using the motorcycle.

Preliminary operations

After the preliminary procedure to be adopted at each motorcycle start

BATTERY

- Check the zero load voltage of the battery which must be between: 12.8V < V battery < 13.7V
- If the battery is empty, before performing any calibration, it is essential to proceed loading the battery, so that then each calibration has a positive result.

PHONIC WHEELS SPEED SENSORS

- It 'important to check the distance between the ends of the speed sensor and the teeth of reading the phonic wheel (Gap).
- The measurement must be as follows: 1.0 mm < GAP < 2.0 mm

GEARBOX

- Check and calibration gears threshold
- Check gear ratio and final ratio (pinion/crown)
- Gear coupling. Set ALWAYS to "NO"

NOTE

THESE OPERATIONS MUST ALSO BE PERFORMED IF ANY CHANGE TO THE GEAR WAS MADE (GEAR RATIO, GENERAL CHECKS OR AFTER FALLS).

GAS

- Reset gas 0 with throttle control (demand) in closed position
- Reset gas 100 with throttle control (demand) in fully closed position

NOTE

THESE OPERATIONS MUST ALSO BE PERFORMED IF ANY CHANGE TO THE THROTTLE CONTROL OR AFTER FALLS WAS MADE.

RBW

- Calibrate the throttle bodies opening

NOTE

THIS OPERATION MUST BE PERFORMED WHEN THE AIRBOX IS REPLACED OR AFTER FALLS.

GENERIC SENSORS

- FRONT SUSPENSION
- REAR SUSPENSION
- FRONT BRAKE SENSOR Reset the visualisation in real time of the front brake system pressure with brake lever in rest position
- REAR BRAKE SENSOR The rear brake system pressure is not acquired
- OIL PRESSURE The engine oil pressure is not acquired.
- OIL TEMPERATURE The engine oil temperature is not acquired
- FUEL PRESSURE The fuel pressure is not acquired
- FUEL TEMPERATURE The fuel temperature is not acquired
- AIR PRESSURE
- AIR TEMPERATURE Intake temperature from the engine, no operation to be performed
- WATER TEMPERATURE Water temperature, no operation to be performed

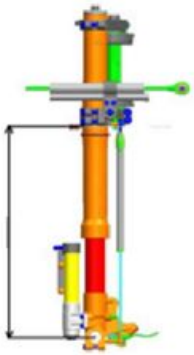
CAUTION

IN THE PDA PAGES RELATIVE TO THE SENSORS ABOVE NEVER MODIFY THE DEFAULT VALUES OF THE PARAMETERS X1,X2,Y1,Y2

SUSPENSION SENSORS

FRONT SUSPENSION

The image below shows the correct assembly of the front suspension motion sensor. The length measured from the sensor is the distance between the lower table of the lower plate and the rotating centre of the front wheel.



For the correct calibration of the motion sensor the motorcycle must be lifted at the front with a stand, so that the front wheel is not in contact with the ground. Then press the front wheel with the foot in order to obtain the maximum extension of the front fork. The motorcycle must remain in this position until the calibration procedure is completed. In this position measure with a metric device, take the measure between the two above mentioned points and correct the measure "L" (length) on the PDA in the page SETTING>SENSORS>SUSP FRONT. Then modify the offset value so that the measure that is read in real time is the same as of "L".

key:

1. Value "L_fork" in millimetres
2. Offset value
3. "Value" parameters

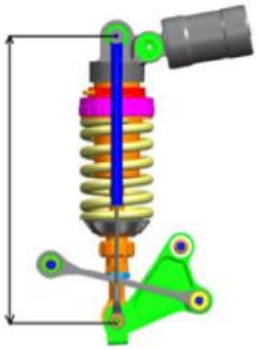
- Complete the value "L_fork" in millimetres
- Modify the offset value until the "value" parameters (in real time) turn it to "L_fork"

CAUTION

DO NOT MODIFY THE DEFAULT VALUES OF THE PARAMETERS X1,X2,Y1,Y2

REAR SUSPENSION

- The following image shows the correct mounting of the motion sensor of the rear suspension.



- For the correct calibration of the motion sensor the motorcycle must be lifted at the rear with a stand, so that the rear wheel is not in contact with the ground. Completely loosen the bolt fixing the shock absorber in the upper part, in this condition it will be in "neutral" position. This is the condition to effect the measurement of the centre to centre distance of the shock absorber with a metric device. This measurement must than be shown at the item "L" in the page "SUSP REAR"

key:

1. Value "L_Shock" in millimetres
2. Offset value
3. "Value" parameters

- Complete the value "L_Shock" in millimetres
- Modify the offset value until the "value" parameters (in real time) turn it to "L_Shock"

CAUTION

DO NOT MODIFY THE DEFAULT VALUES OF THE PARAMETERS X1,X2,Y1,Y2

AIR PRESSURE

- On the motorcycle there is no barometric pressure sensor, however it is possible to reconstruct the pressure inside the airbox through an algorithm that recalculates it depending on the speed. For a precise calculation the barometric pressure must be "virtual "aligned with actual barometric pressure by aligning the channel AIR PRESS SET in the menu ENGINE of the PDA.

CAUTION

INSIDE THE MENU OF THE PDA SETTINGS>SENSORS>PAIR IS ANOTHER RESET OF THE BAROMETRIC PRESSURE, BUT THIS DOES NOT NEED ANY MODIFICATION TO THE CORRECTIONS OF THE MAP AND THEREFORE SHALL NEVER BE MODIFIED.

GEARBOX LOAD CELL (OPTIONAL)

To enable the load cell of the gear, refer to the PDA manual (PARAMETERS> GEAR SHIFT) After the reset procedure:

- LOADZERO With the load cell in rest position (not loaded) press the key [ENTER] to reset the value of the loaded load cell
- THRUP and THRDW: Check that with the UP gear the applied force in real time gives positives values, but the DOWN gear instead gives negative values. For the setting of the strategy activation thresholds (Gear shift and Kicker\Blipper), refer to the PDA manual (PARAMETERS> GEAR SHIFT).

B

Battery: *67*

D

Display: *31*

I

Instrument panel: *6*, *11*, *13*, *31*